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December 10, 2024

Mr. Tracy Smith
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau D
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RE: Onondaga Lake 2020 Monitoring and Maintenance Report
Dated: December 2024
Consent Order No: 89-CV-815; Site No 734030

Dear Mr. Smith:

Enclosed is the Onondaga Lake 2020 Monitoring and Maintenance Report, dated December 2024, per your approval letter of December 10, 2024.

In an ongoing effort to be eco-friendly, we are sending this document electronically only, unless we hear otherwise from you. Please feel free to contact Mark Arrigo at 315.552.9684 if you have any questions or require additional information.

Sincerely,

Shane R Blauvelt

Shane Blauvelt, PE
Senior Remediation Manager

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December 10, 2024

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Re: Onondaga Lake 2020 Monitoring and Maintenance Report

Dear Shane:

The New York State Department of Environmental Conservation (NYSDEC) has received and reviewed the "Onondaga Lake 2020 Monitoring and Maintenance Report" submitted via email by Mark Arrigo of Parsons on December 6, 2024 and the document is hereby approved. Please see that this document, along with this approval letter, is sent to the document distribution list. If you have any questions, please contact me at 518-402-9796.

Sincerely,

Tracy A. Smith

Tracy A. Smith
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ONONDAGA LAKE
2020 MONITORING AND MAINTENANCE REPORT

ONONDAGA COUNTY, NEW YORK

Prepared For:

Honeywell

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Prepared By:

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DECEMBER 2024

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ATTACHMENT 1 2020 ANNUAL POST CLOSURE CARE SUMMARY REPORT FOR THE ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA (SCA)

LIST OF ACRONYMS

Acronym	Definition
BSQV	bioaccumulation-based sediment quality value
CMU	cap management unit
DDT	dichlorodiphenyltrichloroethane
DUSR	Data Usability Summary Report
ft	foot/feet
GAC	granular activated carbon
IRM	Interim Remedial Measure
ISUS	*in situ* ultraviolet spectrophotometer
MERC	Modified erosion-resistant cap
Metro	Metropolitan Syracuse Wastewater Treatment Plant
µg/L	microgram(s) per liter
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
mm	millimeter
MPC	Modified Protective Cap
MNR	monitored natural recovery
MT	metric ton(s)
N_2	dinitrogen gas
NAVD88	North American Vertical Datum of 1988
ng/kg	nanogram(s) per kilogram
ng/L	nanogram(s) per liter
NO_2-N	nitrite-nitrogen
NO_3-N	nitrate-nitrogen
NOAA	National Oceanic and Atmospheric Administration
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OLMMP	Onondaga Lake Monitoring and Maintenance Plan
O&M	operations and monitoring
PCB	polychlorinated biphenyls
PEC	probable effects concentration
PRG	preliminary remediation goal

Acronym	Definition
QAPP	Quality Assurance Project Plan
RA	Remedial Area
RAO	remedial action objective
ROD	Record of Decision
SMU	Sediment Management Unit
SOP	standard operating procedures
SU	Syracuse University
SUNA	submersible ultraviolet nitrate analyzer
SUNY ESF	State University of New York College of Environmental Science and Forestry
SVOC	semi-volatile organic compounds
SWQS	surface water quality standards
TEQ	toxic equivalency quotient
TLC	thin layer cap
UFI	Upstate Freshwater Institute
USACE	U.S. Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WB 1-8	Wastebeds 1-8

EXECUTIVE SUMMARY

Honeywell continues progress toward achieving the goals of the Onondaga Lake Record of Decision (ROD) and the community's vision for a restored Onondaga Lake with the implementation of the long-term lake monitoring program. The remediation plan was selected by the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (USEPA). Under NYSDEC oversight, the Honeywell team developed and implemented a remedy design that was approved by both agencies and continues to demonstrate its effectiveness in meeting the objectives outlined in the ROD. The remedy included a combination of dredging, capping, and habitat restoration – standard environmental cleanup methods that addressed the contamination in lake sediments and water. Lake dredging was completed in November 2014. Approximately 2.2 million cubic yards of material were removed from the bottom of the lake. Capping was completed in December 2016. More than 3 million cubic yards of material consisting primarily of sand, activated carbon, and gravel were used to cap 475 acres of the lake bottom. The cap also provided a new habitat layer. Habitat restoration, including shoreline wetland restoration and extensive planting of aquatic native species, was completed in late fall 2017.

The Honeywell design team consisted of more than 100 local engineers and scientists working with nationally recognized experts from various universities, research institutions, and specialty engineering firms, NYSDEC, and USEPA. Community stakeholders also provided input. Similarly, the Honeywell team developed the lake monitoring program with input from many of the same team members, including Parsons, Anchor QEA, Upstate Freshwater Institute (UFI), the State University of New York College of Environmental Science and Forestry (SUNY ESF), NYSDEC, and USEPA.

The Onondaga Lake Monitoring and Maintenance Plan (OLMMP) (Parsons 2018b) presents the criteria, monitoring program, and decision-making framework for measuring progress toward, and attainment of, the remedial goals set forth in the ROD (NYSDEC and USEPA 2005). The monitoring program enables the team to track progress and ultimately verify remedy effectiveness in achieving the preliminary remedial goals (PRGs) and, thereby, the remedial action objectives (RAOs) specified in the ROD.

This report presents the comprehensive results from the 2020 lake monitoring program. Overall, results indicate that the remedy is protective of human health and the environment, consistent with expectations in the ROD that fish tissue levels may take up to 10 years to decline. It is recommended that monitoring should continue in 2021 as specified in the OLMMP. The monitoring and maintenance program includes seven separate, but related, elements. Each of these elements, along with results and recommendations are summarized below.

As noted by the USEPA in its Second Five-Year Review Report, a protectiveness determination of the remedy for the Lake Bottom Subsite cannot be made until additional post-construction fish tissue data are available to ascertain when the remedial goals identified in the ROD will be achieved. It is anticipated that at least four additional years of fish data will be needed to determine when the rates of decline can be estimated with statistical significance. Following the evaluation of the additional data, a protectiveness determination will be made. In the interim, remedial operation, maintenance

and monitoring activities will continue to be implemented in accordance with existing plans and requirements.

Sediment Management Unit 8 (SMU 8) Monitored Natural Recovery (MNR). The primary natural recovery mechanism in SMU 8 (deep water portions of the lake) is burial of sediment by incoming cleaner sediments that are continually being deposited from overlying water. MNR is projected to achieve the ROD-specified sediment remedial goals for the uncapped portions of SMU 8 within 10 years after the remediation of upland sources and littoral sediments and initial thin-layer capping in SMU 8. The Onondaga Lake 2018 Annual Comprehensive Monitoring and Maintenance Report documented that MNR is progressing faster than anticipated. It was recommended that surface sediment sampling for assessing achievement of MNR goals, including compliance with mercury probable effects concentration (PEC) and bioaccumulation-based sediment quality value (BSQV) criteria, be performed in 2020. However, this monitoring was postponed until 2021 due to challenges associated with COVID-19. The 2020 MNR scope consisted of sediment trap sampling. Results from sediment trap monitoring conducted in 2020 support the conclusion that MNR in SMU-8 is progressing consistent with or faster than expectations. Therefore, the monitoring scope for 2021 will include sediment trap monitoring, as well as the first sediment monitoring event for compliance sampling and the collection of cores from microbead plots. The 2021 sampling will be the first year of the two compliance sampling events. If the 2021 sampling indicates SMU 8 sediments have achieved remedial goals, a second compliance sampling event would occur in 2022 consistent with the compliance sampling protocol in these areas, including both SMU 8 and littoral zone locations.

Biota Tissue. As discussed in Section 3, following careful examination of all the homogenated fish samples from 2020 it was determined that a subset of fish samples were improperly homogenized by the independent laboratory conducting the analysis. Of the 148 fish samples collected in 2020, 56 were improperly homogenized. Based on a technical review of the homogenization issues and quality assurance results by the project teams (i.e., NYSDEC and Honeywell), it was decided that the resulting data associated with the 56 improperly homogenized fish would not be used or reported, and the analytical results from the 92 properly homogenized fish will not be used for decision making or statistical analysis in this report or in future reports. Because of this, discussion of the 2020 results in this report has been substantially reduced compared to previous years and is limited to a brief summary of the range in results.

Zooplankton tissue analysis for both total mercury and methylmercury was conducted in 2020 as per the OLMMP. Results are further discussed in Section 3 of this report. It is recommended that annual fish and zooplankton monitoring be completed in 2021 as per the OLMMP and the 2021 Onondaga Lake Scope Memorandum (Parsons 2021).

Surface Water. In accordance with the OLMMP, surface water sampling and analysis was completed in 2017 and 2018 at numerous locations to assess compliance with goals. Surface water criteria for mercury, volatile organic compounds and semi-volatile organic compounds (SVOCs) have been achieved for two consecutive years. Surface water sampling did not take place in 2020, and therefore no discussion of surface water monitoring is included in this report. Although a surface water compliance event was not completed in 2020, mercury was analyzed from the South Deep station as part of the Nitrate Addition Program in 2020. Five of the 14 samples collected at the 2-meter water depth and one of six samples collected at the 16-meter water depth exceeded the surface water quality

standard (0.7 ng/L). Dissolved mercury will continue to be analyzed as part of the nitrate addition program in 2021. Additionally, monitoring is planned for 2021 to further assess polychlorinated biphenyl (PCB) concentrations in the lake and its tributaries and mercury in the lake.

Cap Maintenance and Monitoring. Cap physical monitoring was conducted in 2020 to verify that the cap remains protective. Consistent with the OLMMP, the 2020 monitoring program included a focused rather than a comprehensive physical monitoring event. This included physical monitoring in the modified protective caps (MPCs), modified erosion-resistant caps (MERCs), and SMU 8 thin layer caps (TLCs) and direct application areas included in the design revisions. An additional investigation was also conducted in Remedial Area (RA)-E Zone 2 to further evaluate anomalies from the 2019 monitoring. Results from the monitoring in 2020 and the comprehensive monitoring in 2019 verify that the cap remains physically stable, with no significant loss of cap material in any of the capped areas. Consistent with the OLMMP, monitoring in 2021 will consist of supplemental physical monitoring to address anomalies found in 2019 and 2020.

Consistent with the monitoring schedule specified in the OLMMP, chemical monitoring was not completed in 2020. Comprehensive chemical monitoring of the caps will be implemented in 2022, as specified in the OLMMP and additional probing will be performed during the 2022 cap monitoring program in an area of RA-D Outboard West where potential topsoil erosion was observed.

Habitat Reestablishment and Biological Response. Vegetation and wildlife monitoring conducted in 2020 show that newly restored habitats are providing a diverse, functional habitat for a variety of species. Restoring diverse, functioning, and sustainable habitats to the remediated areas of Onondaga Lake was one of the top priorities of the remedial program. Therefore, habitat considerations are a significant component in the long-term monitoring and maintenance plan for the lake.

The fourth year of monitoring for the Mouth of Ninemile Creek and the third year of monitoring for the Wastebed B/Harbor Brook Outboard Area was conducted in 2020. Monitoring of wetland and adjacent upland planted vegetation from 2017 through 2020 verified that all interim goals have been met and restoration areas are on track to meet 5-year goals. Minor maintenance activities in the form of additional plantings were completed in 2020. Additional minor plantings are recommended for 2021 to continue progress toward meeting the long-term vegetation goals specified in the OLMMP.

Habitat monitoring verified the restored areas are attracting robust and diverse wildlife usage. Overall, approximately 115 wildlife species were observed across all remediation areas in 2020. As expected, most were found within the restored wetlands. These included 49 species of birds, 23 of macroinvertebrates, four of mammals, and three of amphibians. Common wildlife species included Great Blue Heron, Mallard, and Double-crested Cormorant. Other notable species included Northern Leopard Frog, Common Water Snake, Tundra and Trumpeter Swans, Pied-billed Grebe, Sharp-shinned Hawk, Bonaparte's Gull, and Bald Eagle.

Over 20 years of research by SUNY ESF has shown that Onondaga Lake is home to a robust and diverse fish community. Data collected in 2020 show that this continues to be the case both within and outside of remediation areas. As detailed in the OLMMP, although there are no goals for the fish community, monitoring is conducted to document how fish are using the newly restored habitats in the lake. Thirty-six fish species were documented in Onondaga Lake in 2020.

Institutional Controls. Institutional controls are actions such as administrative and legal controls that are implemented to help minimize the potential for human health or ecological exposure to sediment contamination and ensure the long-term integrity of the remedy. Institutional controls being implemented at Onondaga Lake include:

- Fish consumption advisories and related public communication activities
- Recreational boating buoys, updated navigational charts, and related public communication activities to prevent recreational boaters from accidently hitting potential navigational hazards created by capping and restoration components of the remedy
- Regulatory permitting controls to prevent damage to the cap from activities such as navigational dredging

The specific institutional controls specified in the OLMMP remain in place and are effective.

Nitrate Addition. Full-scale addition of nitrate in Onondaga Lake during 2020 and prior years successfully met objectives and resulted in methylmercury concentrations in lake water remaining near background levels. Methylmercury can be released from Onondaga Lake bottom sediment in the lake's profundal zone (called SMU 8) if lower waters are depleted of oxygen and nitrate during summer stratification. If methylmercury is released to the water column, it eventually enters the food web where it can bioaccumulate in lake organisms. Addition of nitrate to the lower waters limits methylmercury release and thereby limits mercury bioaccumulation in aquatic life in Onondaga Lake. Methylmercury was effectively controlled during summer lake stratification in 2020 through addition of a diluted calcium nitrate solution. Full-scale addition will continue to be implemented as needed.

SECTION 1.0 INTRODUCTION

1.1 Overview

This annual report presents the comprehensive results of the Onondaga Lake remediation monitoring and maintenance conducted by Honeywell in 2020. The Onondaga Lake Monitoring and Maintenance Plan (OLMMP) (Parsons 2018b) presents the criteria, monitoring program, and decision-making framework for measuring progress toward, and attainment of, the remedial goals set forth in the ROD (NYSDEC and USEPA 2005). The ROD remediation plan selected by the NYSDEC and USEPA included a combination of dredging and capping – standard environmental cleanup methods that addressed the contamination in lake sediments and water. Lake dredging was completed in November 2014, a year ahead of schedule, with about 2.2 million cubic yards of material removed from the bottom of the lake. Capping was completed in December 2016. More than 3 million cubic yards of material consisting primarily of sand, activated carbon, and gravel were used to cap 475 acres of the lake bottom, providing a new habitat layer. Habitat restoration was completed in late fall 2017 and included shoreline wetland restoration and extensive planting of aquatic vegetation.

As detailed in the OLMMP, the lake monitoring program includes the following seven separate, but related, elements:

- Sediment Management Unit 8 (SMU 8) and Monitored Natural Recovery (MNR)
- Biota Tissue
- Surface Water
- Cap Maintenance and Monitoring
- Habitat Reestablishment and Biological Response
- Wastebeds 1-8 (WB 1-8) Shoreline Stabilization and Turbidity Monitoring
- Institutional Controls

Monitoring associated with the above activities began in 2017 under the Draft OLMMP, with NYSDEC approval. In addition, monitoring associated with nitrate addition was conducted in 2020 in accordance with the operations and monitoring (O&M) plan for nitrate addition (Parsons and UFI 2014b). Additional documentation related to the 2020 monitoring scope and modifications is included in Appendix 1A of this document. This report presents the comprehensive results from the 2020 monitoring program. Overall, results indicate that the remedy is protective, consistent with expectations in the ROD that fish tissue levels may take up to 10 years to decline. It is recommended that monitoring should continue in 2021 as per the OLMMP. Recommendations for any changes are set forth in the individual sections below.

In accordance with the OLMMP, surface water sampling and analysis was completed in 2017 and 2018 at numerous locations to assess compliance with goals. Surface water criteria for mercury, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) have been achieved for two consecutive years. With the exception of the sampling for the Nitrate Addition Program, surface water sampling did not take place in 2020, and no discussion is included in this report. However, additional monitoring is planned for 2021 to further assess concentrations of certain parameters both

in the lake and its tributaries, with the scope of that monitoring to be determined in consultation with NYSDEC.

1.2 Document Organization

As per the OLMMP, annual reporting for the various monitoring components generally consists of presenting monitoring data and confirming that data are consistent with expectations. Recommendations are made for future monitoring for each respective component. In addition to the executive summary and this introduction, the report is organized into the following sections:

- Section 2 presents results of monitoring of habitat and biological response.
- Section 3 presents results of biota tissue monitoring activities.
- Section 4 presents results of the MNR monitoring.
- Section 5 presents the results of nitrate addition and associated monitoring in 2020.
- Section 6 presents results cap monitoring activities and the status of institutional controls.
- Attachment 1 presents the Annual Post Closure Care Summary Report for the Onondaga Lake Sediment Consolidation Area (SCA)

Appendices associated with each section provide additional information such as detailed field data, associated data usability summary reports, and other information relevant to the various monitoring elements.

SECTION 2 HABITAT REESTABLISHMENT AND BIOLOGICAL RESPONSE

2.1 Introduction

Habitat-related monitoring was conducted in 2020 to document habitat reestablishment and biological response within remediated areas and in lake-wide reference areas as indicated in the OLMMP (Parsons 2018b). Results show that restored habitats are providing a diverse, functional habitat for a variety of species.

At the Mouth of Ninemile Creek and at the Wastebed B/Harbor Brook Outboard Area, vegetation monitoring included qualitative and quantitative surveys to evaluate vegetative aerial percent cover, relative percent cover of each species, aerial percent cover of invasive species, and cover type. A year-three formal wetland survey was conducted at the the Mouth of Ninemile Creek in 2019 and at Wastebed B/Harbor Brook Outboard Area in 2020 as required by the OLMMP.

Wildlife usage was evaluated throughout 2020 during routine site visits and during critical time periods, such as bird migration and amphibian reproduction windows.

Lake-wide aquatic macrophyte (plant) and fish community surveys were also conducted in 2020. Aquatic macrophyte surveys consisted of qualitative and quantitative surveys to evaluate species composition and estimated density in both remediated and reference areas of the lake. Gill, trap, and seine nets were used to conduct monthly fish community surveys from May through October, during which fish species composition, abundance, and species richness were evaluated. Benthic macroinvertebrate surveys to document recolonization of the new substrate placed as part of the remedy are also part of the monitoring program, with an initial event completed in 2018 and a second event scheduled for 2021.

Monitoring results from 2020 are presented in the following sections.

2.2 Planted Vegetation

The Mouth of Ninemile Creek and the Wastebed B/Harbor Brook Outboard Area are monitored planted areas. As specified in the OLMMP, following five years of monitoring, the vegetation coverage will be compared to the success criteria for the wetland, upland, and in-lake planting areas, defined respectively as 85, 90 and 75 percent or greater cover with five percent or less of invasive species. Interim goals for each year for these areas are discussed below.

The Mouth of Ninemile Creek was planted in 2016 following completion of capping in this area, with 2020 representing the fourth year of the five-year monitoring program in that area. Per the OLMMP, the interim goals for the fourth year following planting in the Mouth of Ninemile Creek are:

- At least 85 percent cover of wetland plants on the Mouth of Ninemile Creek spits
- At least 70 percent cover of wetland plants on the Mouth of Ninemile Creek in-lake planted areas

- Management of all invasive wetland plant species[1]

The Wastebed B/Harbor Brook Outboard Area was planted in 2017 following completion of capping in this area, and 2020 was the third year of the five-year monitoring program for that area. The interim goals for the third year following planting in the Wastebed B/Harbor Brook Outboard Area are:

- At least 80 percent cover of wetland plants in wetland areas
- At least 85 percent plant cover in upland areas
- Management of all invasive wetland plant species [1]
- 90 percent of large trees present in wetland areas
- 100 percent of large trees present in upland areas

Vegetation was monitored in both areas using both qualitative and quantitative evaluation methods as described in the OLMMP. Periodic site visits were made throughout the growing season to document vegetation abundance and diversity and to identify any potential issues before they become significant. Two qualitative reconnaissance surveys were conducted at the Mouth of Ninemile Creek and the Wastebed B/Harbor Brook Outboard Area, during which a comprehensive list of plant species present was documented. At the Mouth of Ninemile Creek, 175 plant species were observed during surveys conducted on June 26 and on August 18, 2020. A total of 198 plant species were observed during surveys conducted at the Wastebed B/Harbor Brook Outboard Area on June 24 and August 12, 2020.

Consistent with Appendix E of the Final OLMMP, quantitative vegetation monitoring was conducted at 18 plots on the Mouth of Ninemile Creek spits and 41 plot locations at the Mouth of Ninemile Creek in-lake planting areas (**Appendices 2A and 2B**). Plot surveys were conducted in late August. Each 50-square-ft plot was assessed for cover type, total aerial cover, and relative cover for each species. Native broadleaf cattail (*Typha latifolia),* coontail (*Ceratophyllum demersum*), common waterweed (*Elodea canadensis*), and sago pondweed (*Stuckenia pectinata*) were the most common species. Relative percent cover of the species documented in sampling plots is summarized in **Table 2.1,** and a photographic log of the area is provided in **Appendix 2A**. Vegetation cover types and wetland acreages across the area were estimated from these data and included extensive areas of emergent wetland and aquatic bed (**Figure 2.1**). Annual control efforts for invasive species is ongoing and was conducted during two separate events: one in June and the other in September/October.

The overall cover of vegetation at the Mouth of Ninemile Creek spits was 92.8 percent, and the overall cover of vegetation at the Mouth of Ninemile Creek in-lake planting areas was 70.7 percent in 2020, meeting the year-4 performance goals stated above. In both planting areas, the invasive species cover has remained under one percent (**Appendix 2B**). The overall vegetation cover is expected to remain stable or increase slightly in 2021, invasive species are expected to remain low, and the Mouth of Ninemile Creek is on track to meet year five performance goals. Plantings in select areas are planned for 2021 to facilitate increased vegetative cover as discussed in Section 2.9 below. A final wetland delineation of the Mouth of Ninemile Creek is scheduled for 2021 as directed by the OLMMP.

[1] An interim goal of zero percent invasive species aims to manage all invasive species on the site regardless of the percentage at which they are found. This will provide the maximum chance of successfully achieving the five percent or less goal after five years.

Similarly, quantitative vegetation monitoring was conducted at 51 wetland plot locations, seven upland plot locations, and six plot locations located within the 25 foot (ft) buffer at the Wastebed B/Harbor Brook Outboard Area (**Appendices 2A and 2B**). Plot surveys were conducted from late August to early September, with the same parameters being assessed in each 50-square-foot plot as were assessed for the Mouth of Ninemile Creek. Broadleaf cattail (*Typha latifolia*), and sago pondweed (*Stuckenia pectinata*), were the most common species. Relative percent cover of the species documented in sampling plots is summarized in **Table 2.2**, and a photographic log of the area is provided in **Appendix 2A**. Vegetation cover types and wetland acreages across the area were estimated from these data and included extensive areas of emergent wetland and aquatic bed (**Figures 2.2 and 2.3**). The average vegetation coverage in Wastebed B/Harbor Brook Outboard Area upland plots was 100 percent. The average vegetation coverage in wetland plots was 87.7 percent. Invasive species cover across the upland area was 1.0 percent and invasive species cover across the wetland area was 0.5 percent during the 2020 survey. In addition, large tree conditions were surveyed in the Wastebed B/Harbor Brook Outboard Area in early September 2020 (**Figures 2B.4 and 2B.5** in **Appendix 2B)**. All 103 large trees planted during restoration survived and were generally in good condition. Tree condition survey results are summarized in **Table 2.3**. Two trees were observed in poor condition and will be replaced in 2021. As in the Mouth of Ninemile Creek, annual control for invasive species is ongoing and was conducted once in June and once in September/October of 2020.

A formal wetland survey was conducted in Wastebed B/Harbor Brook Outboard Area in 2020. The wetland survey documented 10.8 acres of wetland habitat. The survey assessed extent and community composition of the wetland communities present including persistent emergent wetlands, non-persistent/aquatic beds and scrub-shrub or young forested wetlands. Common species in the emergent wetland communities were broadleaf cattail (*Typha latifolia*), softstem bulrush (*Schoenoplectus tabernaemontani*) and bur-reed (*Sparganium* spp.). Common species in the non-persistent/aquatic beds were emergent species such as pickerelweed (*Pontederia cordata*), floating aquatic species such as white water-lily (*Nymphaea odorata*) and submerged aquatic species such as water stargrass (*Heteranthera dubia*). Common species in the scrub-shrub or young forested wetlands were silver maple (*Acer saccharinum*) and black willow (Salix nigra) with an understory of shrubs such as silky dogwood (*Cornus amomum*). The survey also noted tremendous wildlife usage including numerous waterfowl, wading birds (Great Blue Heron, Great Egret and Green Heron), shorebirds (Spotted Sandpipers, Yellowlegs and Plovers) and raptors (Bald Eagle and Osprey). Results of the formal wetland survey can be found in **Appendix 2C**. In the Wastebed B/Harbor Brook Outboard Area, a wetland delineation is scheduled for 2022.

2.3 Aquatic Macrophytes

Monitoring of aquatic macrophytes was conducted in 2020 to document the natural recolonization by aquatic plants in remediation areas and the coverage in reference areas. As detailed below, significant natural recolonization of capped areas has occurred. There are no specific success criteria for aquatic vegetation that naturally recolonizes remediated areas.

2.3.1 Qualitative Survey

In June and August 2020, qualitative visual surveys of aquatic macrophyte coverage were conducted from a boat along the entire shoreline of Onondaga Lake, including remediated and non-remediated areas. Surveys were completed in accordance with the standard operating procedures (SOPs) found in the Quality Assurance Project Plan (QAPP) (Parsons 2020c). The spatial coverage of each plant type was estimated, and plants were identified to as high a taxonomic resolution as possible in the field. Vegetation coverage was assigned one of four categories: absent (0 percent cover), sparse (1 through 25 percent), moderate (26 through 75 percent), and dense (76 through 100 percent).

Lake-wide, 16 species were observed during the qualitative surveys. The most common species during the June monitoring event were sago pondweed (*Stuckenia pectinata*), curly pondweed, (*Potamogeton crispus*), and starry stonewort (*Nitellopsis obtusa*). The most common species during the August monitoring event were starry stonewort (*Nitellopsis obtusa*), water stargrass (*Heteranthera dubia*), and coontail (*Ceratophyllum demersum*). Species such as common waterweed (*Elodea canadensis*), American eelgrass (*Vallisneria americana*), and wild rice (*Zizania aquatica*) were also observed. Although the size, distribution, and density of beds were variable, most of the lake, including remediation areas, was characterized by moderate to dense macrophyte coverage. Data from the qualitative surveys are summarized in the figures included in **Appendix 2D**.

2.3.2 Quantitative Survey

A quantitative survey was performed during August in both remediated and non-remediated areas of the lake in accordance with the SOP. Survey data can be found in **Appendix 2D**. Throw rake samples were collected from a boat at predetermined coordinates. A value between 0 and 3 was assigned for each throw rake, reflecting the categories used for the qualitative survey. Density was determined to be absent (category 0) through dense (category 3). Density was assigned for each taxon identified on the throw rake and an average lake-wide density was calculated from 0 to 3.

Lake-wide, 17 species were observed during the quantitative survey. The three most common species were starry stonewort (*Nitellopsis obtusa*), coontail (*Ceratophyllum demersum*), and water stargrass (*Heteranthera dubia*) (**Appendix 2D**). Compared to the qualitative survey plant density (average lake-wide density of 2.17), the quantitative survey documented a somewhat lower plant density overall (average lake-wide density of 1.18). Overall, fewer of the quantitative sampling locations in remediated areas contained vegetation in 2020 than in 2019. In unremediated areas, more sampling locations contained vegetation in 2019 than in 2020. Three invasive aquatic species were observed during the quantitative survey; Eurasian water-milfoil (*Myriophyllum spicatum*), starry stonewort (*Nitellopsis obstusa*) and curly pondweed (*Potamogeton crispus*). Although unremediated areas contained higher macrophyte density than remediated areas, they also contained a higher relative cover of invasive species. In unremediated areas, invasive species accounted for 41.3 percent of macrophyte density, whereas invasive species accounted for only 8.5 percent of macrophyte density in remediated areas.

Although macrophyte presence declined in 2020 in remediated areas compared to 2019, year-to-year density is expected to fluctuate and macrophyte density lake-wide remains sufficient for wildlife usage. Although fluctuations in density are anticipated, success of vegetation in remediated areas is expected to continue.

2.4 Overall Wetland Acreage

As detailed in the OLMMP, wetland acreages will be assessed holistically across the Ninemile Creek spits, Wastebeds 1-8 wetlands, and the Wastebed B/ Harbor Brook Outboard Area to determine if mitigation acreage goals have been attained. **Table 2.4** summarizes the 2020 estimated wetland acreage for each area. Although the estimated wetland acreage across the restoration areas for 2020 shows that the wetland mitigations acreage goals are being met, the overall wetland acreages goals have to be assessed holistically once all areas have been officially delineated at the end of their respective five-year monitoring periods.

The OLMMP also details the assessment of open water requirements within the Wastebed B/Harbor Brook Outboard Area. **Table 2.4** summarizes the 2020 estimated open water acreage for the Wastebed B/Harbor Brook Outboard Area. As with wetland acreages, the 2020 estimated open water acreage shows that goals are being met; however, the wetland and open water areas will be reviewed holistically in year 5 when a formal delineation is performed.

2.5 Fish Community

Over 20 years of research by SUNY ESF has shown that Onondaga Lake is home to a robust and diverse fish community. Data collected in 2020 show that this continues to be the case both within and outside of remediation areas. As detailed in the OLMMP, although there are no goals for the fish community, monitoring is conducted to document how fish are using the newly restored habitats in the lake (Parsons 2018b). Monthly assessments were conducted from May through October 2020 at 12 locations around Onondaga Lake (**Figure 2.4**). Fish were collected using gill nets, trap nets, and seine nets. The species were identified and recorded before the fish were released. Additionally, the lengths of the first 30 individuals of each species were measured at each collection event. The abundance of additional individuals was also recorded. Fish data are provided in **Appendix 2E** and discussed below.

2.5.1 Lake-wide Results

Lake-wide fish species richness in 2020 was 36 species. This is slightly lower than the lake-wide average richness of 40 species observed during the baseline sampling period (2008 through 2011), the 38 species observed during the construction period (2012 through 2016), the 42 species observed in 2018, and the 45 species observed during 2019 (**Table 2.5**). The species richness in remediated areas (33) and reference areas (33) were comparable to average richness within these areas during the baseline and construction periods. Although overall species richness was lower in 2020 than in previous years, this was due primarily to a lack of observations of rare species with low relative abundance, such as Cutlips Minnow (*Exoglossum maxilingua*), Logperch (*Percina caprodes*), Goldfish (*Carassius auratus*) and Tessellated Darter (*Etheostoma almstedi*). Fluctuations in annual species richness is expected due to variable catchability of less abundant species.

Year-to-year fluctuations in the relative abundance of fish are expected due to natural variability in such factors as year-class strength and catchability. Overall, however, the lake continues to contain a predominantly warm water fish community with abundance proportions similar to those of the baseline sampling period prior to dredging and construction. The relative abundance of the most common

species in 2020 are Banded Killifish (*Fundulus diaphanous*) (34.04 percent), Round Goby (*Neogobius melanostomus*) (23.37 percent), Bluegill (*Lepomis macrochirus*) (9.04 percent), Largemouth Bass (*Micropterus salmoides*) (9.02 percent), Alewife (*Alosa pseudoharengus*) (5.92 percent), and Rock Bass (*Ambloplites rupestris*) (4.90 percent). The overall relative abundance data for fish species in the lake can be found in **Appendix 2E**.

2.5.2 Northern Pike Monitoring

The construction of the Wastebed B/Harbor Brook Outboard Area wetlands was completed in 2017. In 2020, the third year of monitoring for fish spawning was conducted in the Wastebed B/Harbor Brook Outboard Area wetlands in accordance with Section 7 and Appendix E of the OLMMP (Parsons 2018b). These events focused on monitoring for evidence of spawning/reproduction of Northern Pike (*Esox lucius*) and/or other wetland spawning species. Early season monitoring efforts were carried out from March 11 through May 7 during the Northern Pike spawning season to assess whether the area was being used by spawning adults. Further monitoring efforts occurred from June 23 through July 16 during the months when the young of the year would likely be present and catchable in the wetlands.

The timing of the spawning season monitoring was determined by surface water temperature in the wetland. Northern Pike generally spawn in temperatures from 40-52°F (Smith 1985), so monitoring was conducted while the surface water temperatures in the wetlands were within this range. Trap nets and visual surveys were used during the spawning period in an attempt to document use of the wetlands. Fifteen trap nets were set for 24-hour periods in the Wastebed B/Harbor Brook Outboard Area wetlands (**Figure 2.5**). Monitoring in June through July was focused on capturing the young of the year. Monitoring was conducted by placing twenty 24-hour minnow traps and making visual observations (e.g., looking for schools of juveniles, scouting for areas to target trapping) while walking the shoreline/berms. Seine nets were not used for this monitoring to minimize disturbance of establishing vegetation that was installed in 2017 or uprooting the new maintenance plantings that were installed from 2018 through 2020. Monitoring at Location 1 was limited during 2020 because of limited shoreline access due to construction of the Loop the Lake trail pedestrian bridge.

No adult or juvenile Northern Pike were observed during the monitoring period. However, 20 species were observed during the March through May monitoring event, including wetland spawning species such as Bluegill, Pumpkinseed (*Lepomis gibbosus*), Yellow Perch (*Perca flavescens*), and Brown Bullhead (*Ameiurus nebulosus*), as shown in **Appendix 2E.** This indicates that the newly established habitat is functional and being used by fish that spawn in wetlands. Eleven species were observed during June through July monitoring event, including, Pumpkinseed, Bluegill, Common Carp (*Cyprinus carpio*), and young-of-the-year Largemouth Bass, indicating that newly established habitat is also providing functional nursery habitat for young-of-the-year fish. Northern Pike are uncommon in Onondaga Lake so it was not unexpected that they were not observed during the monitoring period. It is recommended that monitoring of this area continue in 2021 as described in the OLMMP (Parsons 2018b).

2.6 Wildlife

Wildlife observations were recorded during approximately 34 site visits across Remediation Areas A through E during 2020. Remediation areas are providing high quality habitat for a diverse community of wildlife species. Although there are no specific success criteria for wildlife usage in remediated areas, monitoring is conducted to document functional wildlife use. Wildlife observations in 2020 were recorded during routine site visits throughout the year and during the two qualitative surveys described for vegetation, as indicated in the SOP included in Appendix A of the QAPP (Parsons 2018c). Additional observations were made during several focused monitoring events conducted during key times of the year (e.g., spring and fall migrations for waterfowl, spring for amphibians). Because amphibians can be challenging to observe directly, call surveys were conducted during the breeding period in early June when minimum daily temperatures reached 50°F.

The restored areas are attracting diverse wildlife, including large numbers of migrating waterfowl during spring and fall. Overall, approximately 114 species were observed across all remediation areas in 2020. As expected, most were found within the restored wetlands. This included 49 bird species, 36 fish species, 23 macroinvertebrate species, four mammal species, and two amphibian species. Common wildlife species included Great Blue Heron (*Ardea herodias*), Mallard (*Anas platyrhynchos*), and Double-crested Cormorant (*Phalacrocorax auritus*). Other notable species include Northern Leopard Frog (*Lithobates pipiens*), Common Water Snake (*Nerodia sipedon*), Tundra and Trumpeter Swans (*Cygnus columbianus* and *Cygnus buccinator*), Pied-billed Grebe (*Podilymbus podiceps)*, Sharp-shinned Hawk (*Accipiter striatus*), Bonaparte's Gull (*Chroicocephalus Philadelphia*) and Bald Eagle (*Haliaeetus leucocephalus*). Wildlife observations are summarized in Appendix 2E.

2.7 CSX Habitat Summary

In 2020, quantitative macrophyte community data were taken at the same predetermined 18 plot locations in CSX utilized in prior monitoring events (Appendix 2D). Aquatic macrophyte diversity and density was determined using the same methods as the quantitative survey for the lake-wide macrophyte survey. The most common species in 2020 were common waterweed (*Elodea canadensis*), coontail (*Ceratophyllum demersum*), and sago pondweed (*Stuckenia pectinata)*.

In 2020, overall CSX species richness was 10, with an average species richness per plot location of 3. Since baseline data were taken in 2016, average plot macrophyte density increased from 1.19 (sparse) in 2016 to 1.8 (moderate) in 2020. Average macrophyte plot density was 2.0, 1.8, and 2.3 in 2017, 2018 and 2019, respectively. The macrophyte community appears to have generally stabilized around 2 (moderate density) since the remedy. Furthermore, native species diversity continues to increase, representing suitable habitat for the fish community.

In late April 2020, the second and final year of supplemental seeding with 500 pounds of wild rice was completed in the CSX area to determine if offshore vegetation in this area could be further enhanced, as per the Onondaga Lake Baseline Habitat Characterization for the CSX Shoreline Area of Remediation Area E (Parsons 2019). In August 2020, wild rice was observed growing in moderately dense patches along the CSX area shoreline. Along with the quantitative macrophyte survey, this area will be monitored again in 2021 to evaluate the growth of wild rice.

2.8 Maintenance and Response Actions

Maintenance and response actions consisted of invasive plant control, supplemental plantings, and an assessment of soil quality in target planting areas. Invasive plant control focused on common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), and water chestnut (*Trapa natans*). Supplemental plantings were conducted to address areas with low percent cover and to facilitate achievement of success criteria. To prevent herbivory of newly planted plugs, exclosures around critical planting areas were installed in May and removed once plants had established in October. Plantings in 2020 included bare root trees/shrubs and plugs of primarily emergent wetland species. At the Mouth of Ninemile Creek, 22,000 plugs were planted on the spits and shoreline (**Appendix 2B**). In the Wastebed B/Harbor Brook Outboard Area, 750 bare root trees/shrubs and 18,000 plugs were installed. As recommended in the 2019 report, five large trees were replaced in spring 2020. **Table 2.6** contains a comprehensive list of the 2020 maintenance tasks.

To evaluate whether soils in target planting areas are conducive to continued plant growth, 24 soil samples were collected in February in the Wastebed B/Harbor Brook Outboard Area and on the spits at the Mouth of Ninemile Creek. Samples were sent to Cornell University Soil Health Laboratory for an assessment of soil health. The Cornell soil health assessment measures several indicators of soil physical, biological and chemical health. Overall, soils scored highly, indicating that they are conducive to plant growth. The results of this assessment can be found in **Appendix 2F**.

2.9 Recommendations for 2021

Based on the results of the 2020 habitat monitoring and maintenance program, monitoring should continue as described in the OLMMP. Additionally, it is recommended that the spits at the Mouth of Ninemile Creek and the deeper zones of the Wastebed B/Harbor Brook Outboard Area receive supplemental plantings to help facilitate goal attainment. In addition, supplemental plantings of floating aquatic species as well as submerged macrophyte species will be performed in the in-lake areas at the mouth of Ninemile Creek. 2021 planting focus areas are shown in **Figures 2.6, 2.7, and 2.8**. All wetland areas will be monitored in spring 2021 and supplemental planting areas will be adjusted accordingly. Additionally, the two large trees that were in poor condition during the 2020 large tree survey will be replaced in 2021.

As described in the OLMMP, benthic macroinvertebrate surveys to document recolonization of the new substrate placed as part of the remedy are scheduled for 2021. In addition, fish community sampling will continue in 2021.

SECTION 3 BIOTA TISSUE

3.1 Introduction

Honeywell has monitored chemical concentrations in the tissue of biota in Onondaga Lake annually since 2008. Tissue monitoring is part of the basis for evaluating the effectiveness of the lake bottom remedy identified in the ROD. Tissue monitoring provides data to support decisions regarding the attainment of remedial goals and to assess remedy effectiveness by comparing post-remediation fish tissue data to the performance criteria, which are discussed in Section 4 of the OLMMP.

This section discusses biota tissue sampling activities and results from the 2020 monitoring period. Monitoring in 2020 included the following:

- Collection and analysis of sport fish, large prey fish, and small prey fish tissue
- Collection and analysis of zooplankton tissue

The relevant performance criteria are as follows:

- Mercury concentrations in Onondaga Lake sport fish fillet samples that are protective of human health (0.3 and 0.2 milligrams per kilogram [mg/kg] wet weight)
- Mercury concentrations in Onondaga Lake prey fish whole body samples that are protective of wildlife (0.14 mg/kg wet weight)

As stated in the ROD (NYSDEC and USEPA 2005), these criteria address the remedial action objective to be "protective of human health by eliminating or reducing, to the extent practicable, potential risks to humans." The ROD states that: "A result of such a reduction could be that humans may consume fish in accordance with the state's general advisory for eating sport fish, which states that an individual eat no more than one meal (one-half pound) per week."

Additionally, concentrations of organic compounds documented in Table 7 of the ROD (NYSDEC and USEPA 2005), including total polychlorinated biphenyls (PCBs) in sport fish and prey fish, dioxins/furans in sport fish, and dichlorodiphenyltrichloroethane (DDT) and metabolites in prey fish, are considered as points of reference (i.e., targets) for future evaluations of risk reduction for human and wildlife consumers of fish. The ROD estimated that concentrations of contaminants in fish will be reduced within 10 years following completion of remedial activities (i.e., by 2026). The Ecological and Human Health Performance Criteria for mercury and the targets for other analytes are summarized in **Table 3.1**.

Sampling in 2020 was conducted in accordance with the Biota Tissue Sampling Work Plan, which was included in Appendix B of the OLMMP (Parsons 2018b), with the QAPP for Onondaga Lake, Geddes Brook, Ninemile Creek, and LCP OU-1 Media Monitoring (Parsons 2020c), and with the 2020 Onondaga Lake Scope Memorandum (Parsons 2020a).

The 2020 monitoring results for zooplankton are summarized in **Section 3.2.2**. Recommendations for monitoring in 2021 are included in **Section 3.3**.

3.2 2020 Monitoring Results

3.2.1 Fish

Sampling for tissue chemical analyses in 2020 was conducted at the same eight locations used from 2008 through 2019 (**Figure 3.1**). Adult sport fish were collected between March 17 and October 15, 2020; large prey fish were collected between May 19 and September 8, 2020; and small prey fish were collected from August 4 through 12, 2020.

Twenty-five individuals were collected for tissue chemical analysis from each of the following four species of adult sport fish (100 total samples): Walleye (*Sander vitreus*), Smallmouth Bass (*Micropterus dolomieu*), Pumpkinseed (*Lepomis gibbosus*), and Common Carp (*Cyprinus carpio*). Samples were collected to target three to four individual fish of each species at each location, to the extent practicable. Fish were targeted based on the sizes specified in the OLMMP (Parsons 2018b). Prey fish sampling included collection of both small and large prey fish, with 14 White Sucker (*Catostomus commersonii*) and 10 Shorthead Redhorse (*Moxostoma macrolepidotum*) collected in 2020. As documented in the Scope Memorandum (Parsons 2020a), 2020 was the first year in which Shorthead Redhorse were collected. White Suckers had been collected in recent years, but their collection presented challenges. Small prey fish species were collected based on availability at the time of sampling and included 14 Banded Killifish composite samples and 10 Round Goby composites, for a total of 24 samples as called for in the OLMMP.

Samples were collected using the methods outlined in the OLMMP, dependent on the target species and size. Otoliths (small ear bones) from each Smallmouth Bass, Walleye, and Common Carp and scales from each Pumpkinseed were collected to estimate fish age. Total length (in millimeters) and mass (to the nearest gram) were recorded for each fish submitted for chemical analysis.

The analytical work scope proposed for 2020 was consistent with the scope outlined in Appendix B (Biota Tissue Sampling Work Plan) of the OLMMP (Parsons 2018b). The approved 2020 Onondaga Lake Scope Memorandum (Parsons 2020a) did not include analysis of dioxins/furans, DDT+Metabolites, and hexachlorobenzene in 2020 fish samples. However, as discussed in the Draft 2019 Annual Monitoring and Maintenance Report and as documented in the 2019 Honeywell Syracuse Fish Tissue Data Usability Assessment (Parsons 2022), it was determined that 2019 fish data, which included analysis of organic compounds, was not usable and therefore was not presented in the 2019 Annual Monitoring and Maintenance Report. With the omission of the 2019 data, it was recommended that dioxins/furans, DDT+metabolites, and hexachlorobenzene be analyzed in 2020 samples in addition to the analysis of mercury, PCBs, and lipids that were previously planned.

As documented in Appendix 3B, following review of the 2020 homogenates, it was determined that a subset of fish samples were improperly homogenized by the laboratory. Of the 148 fish samples collected in 2020, 56 were improperly homogenized. Based on a technical review of the homogenization issues and quality assurance results by the project teams (i.e., NYSDEC and Honeywell), it was decided that the resulting data associated with the 56 improperly homogenized fish would not be used or reported. Discussion of results below are associated with the properly homogenized fish only. In addition, the analytical results from the 92 properly homogenized fish will not be used for decision making or statistical analysis in this report or in future reports. Because of

this, discussion of the 2020 results in this report has been substantially reduced compared to previous years and is limited to a brief summary of the range in results

The number of usable fish samples per species as documented in Table 1 of **Appendix 3.B** include:

- 24 small prey fish
- 22 large prey fish
- 46 sport fish, including:
    - 6 Walleye
    - 13 Smallmouth Bass
    - 8 Common Carp
    - 19 Pumpkinseed

Chemical concentrations and lipid content in prey fish and sport fish are summarized in **Table 3.2a** and **3.2b**, respectively. Analytical results are reported for usable fish samples only. Chemical concentrations in individual usable fish from 2020 are shown in scatter plots for mercury (**Figure 3.2**), PCBs, (**Figure 3.3**), hexachlorobenzene (mostly non-detects) (**Figure 3.4**), and DDT and metabolites (**Figure 3.5**). Dioxins and furans are provided as toxicity equivalency quotients (TEQs); calculated TEQ concentrations are shown with non-detects set to zero (**Figure 3.6**) and one half the detection limit (**Figure 3.7**). A brief discussion of the range of usable fish results are discussed below by analyte. Although the results from 2020 are not being used to compare to criteria or to calculate statistics/trends, the usable results are, in general, within the expected range based on what has been documented in previous years. However, it should be noted that for Carp, Walleye and Smallmouth Bass, which had a significant number of unusable samples due to inadequate homogenization, it is possible that the upper end of the reported ranges of concentrations for the usable samples may be biased low as many of the fish that were inadequately homogenized were larger (and older) fish that would typically have higher concentrations.

Mercury

Mercury concentrations in individual usable fish are presented in **Figure 3.2**. Mercury in small prey fish was detected in 23 out of 24 samples, with concentrations ranging from 0.057 to 0.16 mg/kg. Mercury in large prey fish was detected in 19 out of 22 usable samples, with concentrations ranging from 0.073 to 0.39 mg/kg. Mercury in Smallmouth was detected in all 13 usable samples, with concentrations ranging from 0.11 to 0.95 mg/kg. Mercury in Walleye was detected in all 6 usable samples, with concentrations ranging from 0.28 to 0.82. Mercury in Pumpkinseed was detected in 16 out of 19 usable samples, with concentrations ranging from 0.050 to 0.31 mg/kg. Mercury in Common Carp was detected in 3 out of 8 usable samples, with concentrations ranging from 0.071 to 0.25 mg/kg.

Total PCBs

Total PCB concentrations in individual usable fish are presented in **Figure 3.3**. PCB in small prey fish were detected in 23 out of 24 samples, with total PCB concentrations ranging from 0.018 to 0.52 mg/kg. PCBs in large prey fish were detected in all 22 usable samples, with total PCB concentrations ranging from 0.06 to 0.69 mg/kg. PCBs in Smallmouth was detected in all 13 usable samples, with total PCB concentrations ranging from 0.023 to 1.9 mg/kg. PCBs in Walleye were detected in all 6 usable samples, with concentrations ranging from 0.19 to 0.94 mg/kg. PCBs in Pumpkinseed were

detected in 19 out of 19 usable samples, with total PCB concentrations ranging from 0.0085 to 0.13 mg/kg. PCBs in Common Carp were detected all 8 usable samples, with total PCB concentrations ranging from 0.011 to 0.49 mg/kg.

Hexachlorobenzene

Hexachlorobenzene concentrations in individual usable fish are presented in **Figure 3.4**. Hexachlorobenzene in small prey fish was detected in 7 out of 24 samples, with concentrations ranging from 0.00046 to 0.0013 mg/kg. Hexachlorobenzene in large prey fish was detected in 3 out of 22 usable samples, with concentrations ranging from 0.011 to 0.059 mg/kg. Hexachlorobenzene in Smallmouth was detected in 3 out of 13 usable samples, with concentrations ranging from 0.0022 to 0.029 mg/kg. Hexachlorobenzene was not detected in any of the 6 usable Walleye samples. Due to mass limitations, Hexachlorobenzene was not able to be analyzed in all Pumpkinseed samples. Out of the 19 usable Pumpkinseed samples, 8 were analyzed for Hexachlorobenzene, with concentrations detected in one individual sample at 0.0022 mg/kg.

DDT and Metabolites

DDT and metabolites in induvial usable fish are presented in **Figure 3.5**. DDT and metabolites (calculated as a sum) in small prey fish were detected in 18 out of 24 samples, with calculated concentrations ranging from 0.0009 to 0.0198 mg/kg. DDT and metabolites (calculated as a sum of detected compounds) in large prey fish were detected in 21 out of 22 usable samples, with calculated concentrations ranging from 0.0079 to 0.0841 mg/kg.

Dioxins and Furans

Dioxins and furans are analyzed in a subset of sport fish samples. Dioxin/furan total TEQ in individual usable fish are presented with non-detects set to zero in **Figure 3.6** and one half the detection limit in **Figure 3.7**. TEQs are discussed below with TEQs calculated as non-detects at one half the detection limit.

Total TEQs in 6 usable Smallmouth Bass samples ranged from 1.12 to 3.22 ng/kg. Total TEQs in 4 usable Walleye samples ranged from 0.46 to 1.00 ng/kg. Total TEQs in 12 usable Pumpkinseed samples ranged from 0.11 ng/kg to 1.12 ng/kg. Total TEQs in 3 usable Common Carp ranged from 0.43 to 2.66 ng/kg.

3.2.2 Zooplankton

3.2.2.1 Sampling and Analysis Methodology

Zooplankton samples were collected for mercury analysis at South Deep 17 times from May 12 to November 18, 2020, at a frequency that ranged from weekly to monthly (**Figure 3.1**). Nine of these samples could not be analyzed for total mercury due to insufficient zooplankton biomass and were therefore analyzed only for methylmercury. UFI also attempted to collect samples of large (at least 1 millimeter [mm] long) *Daphnia spp*. zooplankton. Although *Daphnia* were observed on several occasions during summer 2020, the zooplankton community was generally dominated by smaller taxa, including *Bosmina*. As in previous years, *Daphnia* were not present in high enough quantities to isolate a sufficient number for mercury analysis. Although there are no remedial performance criteria for

zooplankton, analysis of mercury and methylmercury concentrations provides a measure of change in potential exposure to fish that eat zooplankton and aid in the understanding of mercury cycling.

3.2.2.2 Results

Wet weight concentrations of total mercury and methylmercury in zooplankton samples collected at the South Deep location in 2020 are presented in **Table 3.3** and **Figure 3.8**. Wet weight total mercury concentrations measured in zooplankton during 2020 ranged from 0.000174 mg/kg (or parts per million) on June 16 to 0.189 mg/kg on July 21. Methylmercury concentrations observed in zooplankton during 2020 ranged from 0.00001 mg/kg on September 9 to 0.315 mg/kg on October 20. The highest methylmercury concentration was reported on October 20; however, this value was a non-detect, with a method detection limit of 0.315 mg/kg and a dilution factor of 500 applied due to limited volume, and therefore was excluded from **Figure 3.8**. The next highest methylmercury concentration was 0.007 mg/kg on August 18. The Data Usability Summary Report (DUSR) for zooplankton is included in **Appendix 3A** of this report.

Contribution of methylmercury to total mercury in 2020 ranged from less than 0.02 percent on September 9 to 30.6 percent on August 18. (**Figure 3.8**). On average, omitting the non-detect results from June 16, methylmercury accounted for approximately 8 percent of the total mercury in zooplankton. Relative to pre-nitrate addition values, methylmercury concentrations in zooplankton have remained consistently low from the first year of nitrate addition through 2020.

3.3 Recommendations for 2021

The OLMMP specifies that annual comprehensive fish monitoring will be completed through at least 2020. It is recommended that fish and zooplankton sampling continue in 2021 as specified in the OLMMP with the complete set of analytes as in 2020. To account for natural variability, performance criteria will be considered to have been met after multiple years of data indicate attainment. As noted in the OLMMP, performance criteria should be met at least three years in a row or four years out of five to verify achievement of goals. Fish monitoring will continue until NYSDEC/USEPA determine that the relevant RAOs and PRGs in the ROD have been achieved.

SECTION 4 MONITORED NATURAL RECOVERY

4.1 Introduction

MNR is a significant component of the remedy for the sediment in Onondaga Lake's profundal zone, which is also referred to as SMU 8. Water depths in SMU 8 are greater than 30 foot (ft), where waters typically stratify thermally from mid-May through mid-October. Natural recovery occurs gradually as older sediment is buried by new sediments with lower mercury concentrations that enter the lake through tributary inflows and direct runoff. Results from monitoring conducted in 2020 and prior years indicate that natural recovery of SMU 8 sediments is progressing faster than expected based on projections made in the Final Design.

Sediment sampling in SMU 8 for mercury analysis is conducted every three years to monitor ongoing natural recovery in accordance with the final design for the lake bottom remedy (Parsons and Anchor QEA 2012). The primary objective of sediment sampling is to provide a basis for determining achievement of the PRGs set forth in the ROD (NYSDEC and USEPA 2005). This includes achieving a mercury PEC) of 2.2 mg/kg or lower on a point-by-point basis in the profundal zone and a mercury BSQV of 0.8 mg/kg or lower on an area-wide basis within 10 years following remediation of upland sources, littoral sediments, and thin-layer capping in portions of the profundal zone. Sediment sampling was last conducted in 2017 and was originally scheduled to occur in 2020. However, due to challenges associated with COVID-19, it was recommended to and approved by NYSDEC that the next sediment sampling event be scheduled for 2021. Monitoring in 2021 will include collection of cores for chemical analysis and collection of cores from microbead plots for visual inspection to assess the depth of mixing of surface sediments and sedimentation rates.

Sampling and analysis of particles that settle through the water column and ultimately settle in SMU 8 is completed annually using sediment traps. Provided below is a detailed discussion of the activities and results from the 2020 sediment trap sampling.

4.2 2020 Monitoring

MNR includes evaluation of sedimentation rates. Sediment traps are deployed on an annual basis to provide supplemental information on the mercury content of settling sediments and to aid in the assessment of sediment deposition rates. Results from sediment trap monitoring conducted in 2020 indicate that sedimentation rates are higher than those assumed during the final design, and concentrations are lower than the assumed value in the MNR modeling conducted during the final design. These results support previous conclusions that MNR is occurring faster than predicted.

Sediment traps were deployed at the South Deep sampling location at a water depth of approximately 33 ft (or 10 meters), which is below the thermocline for most of the summer stratification period. Sampling was conducted from May 5 through November 18, 2020. Deployment periods typically ranged from 6 to 8 days, with one sediment trap deployment spanning 14 days (November 4 to November 18). **Table 4.1** presents mercury and total suspended solids data from 2020. **Appendix 4A**

contains the DUSR associated with MNR. Sediment trap samples were collected continuously over the deployment intervals, and the slurry from the sediment traps was analyzed by Eurofins for low-level total mercury and by UFI for total suspended solids and total fixed solids. The 2020 sampling and analyses were conducted in accordance with the MNR Sampling Work Plan included in Appendix A of the OLMMP (Parsons 2018b) and with the QAPP (Parsons et. al 2020) as approved by NYSDEC. There were no deviations from the work plan in 2020.

Depositing sediment collected from sediment traps deployed each year in the south basin is analyzed for mercury. These data provide estimates of mercury sediment concentrations entering the lake. The average deposition of suspended solids in 2020 was 10,164 mg per square meter per day, which is higher than the 6,850 mg per square meter per day assumed in the Final Design (Parsons and Anchor QEA 2012). Mercury concentrations in sediment trap solids collected in 2020 ranged from 0.08 to 0.75 mg/kg, with a mean of 0.28 mg/kg, which is lower than the mercury concentration of 0.4 mg/kg used in the natural recovery modeling conducted during the Final Design (Parsons and Anchor QEA 2012). From 2011 through the end of construction in 2016, average mercury concentrations in settling sediment ranged from 0.43 mg/kg (2016) to 1.1 mg/kg (2012). Average mercury concentrations in settling sediment since the completion of the remedy ranged from 0.18 mg/kg (2018) to 0.28 mg/kg (2020).

Based on sediment trap results, mercury deposition rates in 2020 averaged 2.35 micrograms per square meter per day. Deposition of total suspended solids ranged from 3,683 to 36,149 milligrams per square meter per day (Table 4.1). Volatile solids are quantified as the difference between total solids and total fixed solids.

4.3 Summary of Results and Recommendations

The results from the 2020 monitoring events support the conclusion that natural recovery of SMU 8 sediments is progressing consistent with or faster than anticipated based on projections completed as part of the Final Design. MNR sediment-based goals may have already been achieved. The Onondaga Lake 2018 Annual Comprehensive Monitoring and Maintenance report documented that MNR is progressing faster than anticipated and recommended that the 2020 sampling consist of the expanded sampling associated with the first compliance sampling event. This will entail sampling from a higher number of sampling locations than was completed during prior sampling events, including both SMU 8 and littoral zone locations, as detailed in the Monitored Natural Recovery Work Plan in the OLMMP. The surface weighted-average concentrations in each of the five zones for comparison to the BSQV will be updated to include these additional sampling locations. However, due to challenges associated with COVID-19, it was recommended and approved by NYSDEC that this sediment monitoring event for compliance sampling and collection of cores from microbead plots be delayed until 2021. The 2021 sampling will be the first year for the two compliance sampling events. If the 2021 sampling indicates SMU 8 sediments have achieved remedial goals, a second compliance sampling event would occur in 2022 consistent with the compliance sampling protocol in these areas and include both SMU 8 and littoral zone locations. Additionally, sediment trap monitoring should continue annually until achievement of MNR goals is demonstrated, as described in the OLMMP.

SECTION 5 2020 NITRATE ADDITION

5.1 Introduction

5.1.1 Purpose and Background

This report describes the activities during and results from the seventh year of full-scale nitrate addition conducted on behalf of Honeywell. Nitrate is being added to maintain nitrate concentrations in the hypolimnion of Onondaga Lake sufficient to mitigate the release and/or production of methylmercury from low levels of mercury in the lake's profundal zone (i.e., deep water) sediment (Parsons and UFI 2014b). Methylmercury is a substance that bioaccumulates in aquatic organisms and can make fish unsuitable for human consumption. Methylmercury was not significantly released from underlying sediment to lower hypolimnion waters during the summer of 2020 when deep lake waters would be prone to methylmercury release in the absence of nitrate addition. This lack of methylmercury release from SMU 8 sediment demonstrates that nitrate addition was again effective in 2020 as it has been since the nitrate addition program began in 2011.

The remedy for the Onondaga Lake bottom is described in the ROD prepared by the NYSDEC and the USEPA in 2005. In 2014, following completion of the three-year nitrate addition pilot test, NYSDEC and USEPA issued an Explanation of Significant Differences that specified continuation of nitrate addition to the hypolimnion of Onondaga Lake as warranted during summer and early fall (NYSDEC and USEPA 2014).

As Onondaga Lake surface water temperatures increase during spring and early summer months, the water column thermally stratifies so the warmer, less dense waters of the epilimnion overlie the colder, denser waters of the hypolimnion. The epilimnion and hypolimnion are separated at a water depth of approximately 30 ft (9 meters) by the thermocline, which greatly limits transport between these layers. The hypolimnion is subject to depletion of dissolved oxygen followed by depletion of dissolved nitrate during the stratification period, which typically extends from mid-May through mid-to-late October. When concentrations of oxygen and nitrate are low, profundal sediments may release methylmercury to the water column. Methylmercury, if present in the profundal zone of the lake, can be transported to the upper waters primarily when lake waters mix in the fall at a time known as fall turnover. During summer periods in years prior to the nitrate addition pilot test, depletion of nitrate in lower waters resulted in higher methylmercury concentrations in those waters.

During 2007 and 2008, releases of methylmercury to the hypolimnion were found to be substantially lower than in prior years due primarily to elevated nitrate concentrations in the lake. The increase in nitrate was a consequence of wastewater treatment upgrades implemented at the Onondaga County Metropolitan Syracuse Wastewater Treatment Plant (Metro) located along the southern (upstream) shore of Onondaga Lake. Wastewater treated at Metro is discharged into the nearshore waters of the lake. In 2004, Onondaga County began operating a biologically-active filter system at Metro that converts ammonia in wastewater to nitrate. As a result, the available pool of nitrate in the hypolimnion at the start of summer stratification almost doubled. In 2005, Onondaga County implemented an advanced phosphorous-removal system that resulted in decreased algal growth in the upper waters

of the lake and reduced demand for oxygen and nitrate in the hypolimnion. Because of Metro's additional wastewater treatment efforts, nitrate persisted in the Onondaga Lake hypolimnion for a significantly greater time during summer months of 2007 and 2008, which inhibited the release of methylmercury from SMU 8 sediments (UFI and Syracuse University [SU] 2007; Todorova et al. 2009). The nitrate addition pilot test was conducted successfully for three years from 2011 through 2013, and the full-scale nitrate addition was conducted from 2014 to present, which has further inhibited the release of methylmercury from profundal zone sediments. The full-scale application program in 2020 is summarized below.

5.1.2 Operation and Monitoring

During 2020, as during previous years, liquid calcium nitrate solution was diluted with upper lake waters and added directly to the lower waters in the profundal zone at three locations in the lake. One application location was in the northern basin of Onondaga Lake, and the other two were in the southern basin of the lake (**Figure 5.1**). The three application locations used in 2020 were the same locations at which nitrate was applied from 2011 through 2019.

In 2020, nitrate was added to the lower, stratified waters of Onondaga Lake in 40 nonconsecutive, single-day applications from July 7 through October 14 (see **Table 5.1**). A target one-day dose of liquid calcium nitrate solution[2] was applied at one of the three application locations during each application day.

Monitoring of lake conditions during 2020 provided the basis for assessing lake conditions directly and indirectly associated with nitrate addition. Three-dimensional monitoring of nitrate concentrations in the lake's profundal zone was completed twice per week during the nitrate addition period. Thirty-four locations were monitored each week, and a subset of 11 of those locations was monitored later in the week. In addition, surface water samples were collected at the South Deep location (**Figure 5.2**) on 23 different dates from May 12 through November 18, 2020, and analyzed for methylmercury and other parameters to confirm the effectiveness of adding nitrate.

Fall turnover, which marks the end of summer stratification, typically takes place between mid-October and early November in Onondaga Lake, depending on complex lake mixing and meteorological factors. In 2020, fall turnover of Onondaga Lake occurred on October 28th.

Nitrate addition O&M was performed in 2020 in accordance with the approved O&M Plan (Parsons and UFI 2014b).

5.1.3 Reporting

Section 5.2 describes the 2020 field activities and identifies any deviations from the work plan. Section 5.2 also presents monitoring data and discusses the results. Section 5.3 summarizes results and provides recommendations for revisions to the application or monitoring program. **Appendix 5A** provides 2020 operational information, including application location, target dilution factor, lake water temperature and specific conductivity data, nitrate and dilution water flow rates, application durations,

[2] The liquid calcium nitrate used was labeled CN-8 by the supplier, Univar of Bedford, Illinois.

and the total amount of nitrate applied during each application. **Appendix 5B** presents an example of daily monitoring information provided on the same day field data were collected. **Appendix 5C** summarizes nitrate concentrations observed one meter above the lake bottom. **Appendix 5D** is the DUSR for relevant laboratory water quality data compiled in 2020. **Appendix 5E** presents depth profile plots of dissolved oxygen, nitrate-nitrogen (NO_3-N), total mercury, and methylmercury water concentrations.

5.2 Presentation of Monitoring Data and Discussion of Results

5.2.1 Mobilization, Monitoring and Observations

Nitrate is added to maintain summertime nitrate-nitrogen levels in the lower hypolimnion (below the 14-meter water depth) at or above 1.0 mg/L, thereby limiting accumulations of methylmercury in hypolimnion waters. This section describes:

- Natural development of thermal stratification
- In-lake monitoring program
- Dissolved oxygen and nitrate resources of the hypolimnion
- Effect of nitrate applications on nitrate levels
- Nitrite concentrations in lake water
- Mercury concentrations in lake water
- Other related monitoring from July through October 2020 when nitrate was being applied

The 2020 lake water quality monitoring for mercury at the South Deep location began on May 12 and continued through November 18 (**Table 5.2**). Measurements of dissolved oxygen, nitrate and other water quality parameters in the deep portion of Onondaga Lake prior to the first application provided the information needed to determine when to start adding nitrate to the lake. Water quality measurements during the nitrate application period helped to guide how much nitrate to apply at each location. Water quality monitoring was also conducted on October 20, October 23, October 27, November 4 and November 18, following the last application of nitrate on October 14, 2020. Samples collected on October 20 were for non-mercury analytes only and samples collected on October 23 were for mercury analytes only. This was the result of a laboratory error necessitating the re-sampling of mercury analytes on October 23.

The 2020 barge equipment, piping, and instrumentation, onshore support area for storage of nitrate, and instrumentation on the UFI monitoring boats included the same elements as in previous years (see Figures 2 through 4 in Parsons and UFI 2014a). Delivery equipment used in 2020 was similar to that used in previous years and was once again set up to maintain a contained, continuous flow from the on-barge equipment to the target application depth.

5.2.2 Application Summary

Nitrate additions were completed in 2020 at the three predetermined locations in the lake used since 2011 (**Figure 5.1**). The three locations where nitrate was applied are referred to as the North location,

South Location #1 (hereafter called South1), and South Location #2 (hereafter called South2). The desired minimum concentration of nitrate-nitrogen to be maintained in the lake (1.0 mg/L) was identified based on frequent water quality monitoring of methylmercury and nitrate in the profundal zone of Onondaga Lake since 2006 and a historical review of methylmercury releases from Onondaga Lake profundal zone sediments. These releases were described in the approved O&M Plan for adding nitrate (Parsons and UFI 2014b).

Thermal stratification became strongly established by mid-May 2020, limiting further significant inputs of oxygen and nitrate from the epilimnion downward to the hypolimnion (below the 30-ft water depth in Onondaga Lake). Stratification initiates an annual period of oxygen and nitrate depletion and locks in place the "ambient" oxygen and nitrate pools or supplies. Therefore, nitrate addition was initiated on July 7, 2020 before hypolimnetic nitrate-nitrogen concentrations could fall below 1.0 mg/L at the 18-meter water depth and continued until approximately two weeks prior to fall turnover. The depth of the thermocline between the epilimnion and hypolimnion was relatively stable through July and August and then descended through September and more rapidly during October until the water column became effectively mixed in the vertical dimension. In 2020, this occurred on October 26.

As in prior years, each application of nitrate in 2020 involved moving and anchoring the barge at the designated application location. A concrete block anchoring system at each application location held the barge stationary for the duration of an application. Inflow and outflow piping with end-of-pipe diffusers were positioned within the lake water column at their target depths. The barge pumps provided water from the epilimnion that was mixed on the barge with full-strength liquid calcium nitrate. The liquid calcium nitrate has a density of approximately 1.47 times the density of lake water. The extent of diluting nitrate with water from the epilimnion was guided during each application by in-lake monitoring. The resulting neutrally buoyant nitrate-water mixture was directed to the lower waters in the lake hypolimnion via hoses and diffusers.

In 2020, nitrate was applied continuously at one of the three pre-determined locations for approximately three to eight hours during each application day. The duration of each application depended on how much nitrate was to be added that day to meet the anticipated nitrate demand in that portion of the lake and the extent of dilution needed to keep the nitrate near but above the lake bottom (i.e., increased dilution meant longer pumping times to apply the same volume of nitrate). A total of 40 applications of nitrate were completed during 2020, including 13 applications at the North location, 17 applications at South1, and 10 applications at South2. Two of the 40 applications were partial doses due to unsafe weather conditions or the approach of sunset.

Table 5.1 and Appendix 5A summarize work completed as part of each 2020 nitrate application. In general, applications were conducted two to three days each week, moving from location to location as directed by results from in-lake monitoring. The pace of applications were slightly accelerated during July and August to keep pace with increased demand for nitrate in the hypolimnion. A total of 77.61 metric tons (MT) of nitrate-nitrogen were added to the lower waters of Onondaga Lake during 2020.

5.2.3 In-Lake Monitoring

Table 5.2 summarizes the in-lake monitoring completed by UFI in 2020, including both field measurements and sample collection. Figure 5.2 illustrates the 2020 lake monitoring locations. The primary objective of in-lake monitoring was to observe and characterize the vertical and horizontal distribution of nitrate in the lake. Using a submersible ultraviolet nitrate analyzer (SUNA) deployed from a boat, UFI provided near real-time feedback on nitrate conditions. The SUNA was used to take measurements of water depth, nitrate-nitrogen, sulfide, temperature, specific conductivity, turbidity and parameters associated with light penetration and primary productivity. Measurements were collected every 0.25 meter vertically throughout the water column at 34 locations. These data were downloaded and processed, and a summary of the lake nitrate concentrations was provided the same day. Each data summary included nitrate-nitrogen profiles at each monitoring location and bubble plots illustrating nitrate-nitrogen concentrations at particular depths within the hypolimnion. These included one plot of all measurements taken one meter above the lake bottom across the footprint of the hypolimnion. The SUNA was also used to identify the effective water depth where the nitrate was applied. This information was communicated to barge operation in real-time to facilitate adjustments to the density of the nitrate solution.

The performance of SUNA and an equivalent instrument (*in situ* ultraviolet spectrophotometer [ISUS]) have been compared with laboratory measurements of nitrate since 2006. Results from 2020 continue to demonstrate that the SUNA nitrate measurements are comparable to laboratory measurements. The nitrate sensor was checked in distilled water routinely and was recalibrated or replaced when measurements fell outside acceptable limits (±0.028 mg/L of nitrate).

In addition to monitoring during each nitrate application, surface water samples were collected at South Deep, which is in the vicinity of the South1 application location, on 22 days from May 12 to November 18, 2020 (Table 5.2) and analyzed for various water quality parameters including total mercury and methylmercury. This was consistent with lake water monitoring efforts completed since 2008. Selected surface water samples from the 2-meter and 16-meter water depths were also analyzed for filtered (i.e., dissolved) total mercury. Surface water samples were collected weekly at South Deep from June 30 through November 4, 2020. Collected surface water samples were analyzed for total mercury, methylmercury, and forms of nitrogen (i.e., nitrate, nitrite and ammonia). Samples collected from July 6 to October 27 in waters at or below 14 meters deep were also analyzed for soluble reactive phosphorus. Fixed-frequency monitoring focused on sample collection at the South Deep location because water quality at the South Deep location has been determined to be generally representative of water quality conditions throughout Onondaga Lake.

5.2.4 Dissolved Oxygen and Nitrate Observations

Figures 5.3 and 5.4, respectively, present dissolved oxygen and nitrate-nitrogen concentrations at the South Deep location for four different water depths from May through November 2020. Figure 5.5 illustrates the depletion of the dissolved oxygen pool at the onset of stratification from May to mid-July 2020, based on measurements from the UFI robotic buoy at the South Deep location. Most of the oxygen available in the hypolimnion during 2020 prior to lake stratification was consumed by early July.

Nitrate applications were successful again in 2020 in keeping the nitrate-nitrogen levels in the hypolimnion above 1.0 mg/L throughout the summer months in deeper portions of Onondaga Lake (**Figure 5.4**). The cumulative mass of nitrate-nitrogen applied in 2020 to the lower hypolimnion was 77.61 MT. The mass of nitrate-nitrogen in the hypolimnion prior to the start of stratification in early May 2020 was approximately 83 MT, which was higher than 2019 due to the return of nitrification of Metro following plant upgrades in 2018-2019. Treated municipal wastewater from Metro is the primary input of nitrate-nitrogen to the lake. When the treatment process is functioning, Metro effluent contains an average of approximately 12.0 mg/L of nitrate nitrogen.

Figure 5.6 presents volume-weighted average nitrate concentrations and mass in the hypolimnion before, during, and following nitrate addition in 2020. The blue line in **Figure 5.6** is the volume-weighted nitrate concentration in the hypolimnion, while the purple line represents the mass of nitrogen. The average rate of nitrate addition in 2020 was 0.79 MT of nitrate-nitrogen per day (5.5 MT per week) throughout the application season. **Figure 5.6** also illustrates the hypolimnion's response to applications of nitrate, with the rate of nitrate depletion slowing when applications of nitrate were ongoing. Nitrate applications began on July 7 and continued at a steady pace through October 14. Applications were stopped for the year after October 14 in anticipation of fall turnover.

Figure 5.7 illustrates apparent 2020 nitrate depletion rates in the Onondaga Lake hypolimnion represented by measurements made in the South Basin and North Basin prior to the initiation of nitrate addition on July 7. Nitrate depletion in the South Basin and North basin, respectively averaged 0.0093 mg/L and 0.0100 mg/L of nitrate-nitrogen per day. Nitrate concentrations in the hypolimnion increased during July and gradually decreased through early September, despite continued nitrate applications. In general, nitrate depletion rates are typically higher when concentrations of nitrate in the hypolimnion are higher.

Table 5.3 presents annual lake conditions and observations for 2011 through 2020 that are important factors associated with adding nitrate. Spring turnover nitrate is the concentration of nitrate in lake waters as the waters begin to stratify, which typically takes place during April-May each year. The 2020 spring turnover nitrate concentration was 2.3 mg/L, substantially higher than concentrations during 2018 and 2019 when nitrification treatment at Metro was shutdown.

Figure 5.8 presents the spatiotemporal distribution of nitrate concentrations in the hypolimnion from early April through mid-November 2020. Areas of the lake with water depths between 14 and 16 meters (46-52 ft) were generally exposed to nitrate-nitrogen concentrations between 1.0 and 2.0 mg/L for most of the mid-June to early October period when nitrate was being applied. Sediments below the 16-meter (52-ft) water depth were generally exposed to nitrate concentrations greater than 1.5 mg/L during the nitrate application period. Nitrate concentrations higher than 3 mg/L were measured immediately following nitrate applications.

Figure 5.9 illustrates the spatial and temporal extent of the measured nitrate-nitrogen concentrations in 2020 at water depths one meter (3 ft) above profundal zone sediments. Concentrations of nitrate-nitrogen above the lake bottom generally ranged from 1.5 to 3.0 mg/L throughout the 2020 nitrate application period, meeting the program goal. The lowest measured concentration of nitrate-nitrogen was 1.03 mg/L on July 7 at a water depth of 18.5 meters (measured by SUNA), which is above the 0.70 mg/L threshold that would trigger supplemental sampling of low level mercury and methylmercury.

5.2.5 Dilution and Dispersion of Applied Nitrate

The specific gravity of the liquid calcium nitrate was 1.47 in 2020. Therefore, significant dilution was required to produce a neutrally-buoyant water-nitrate mixture to take advantage of natural hydrodynamic forces that spread the nitrate around the lower depths of the lake. Once lake monitoring efforts identified an appropriate dilution factor for an application of nitrate, the same dilution factor was used as a starting point for the next application. Further minor adjustments to dilution and pump rates were made based on real-time lake monitoring to achieve a neutrally buoyant plume at the target depth. **Figure 5.10** illustrates epilimnion (dilution water) and hypolimnion water temperatures and dilution factors for the 2020 application period.

During summer 2020, dispersion by natural hydrodynamic forces was again enough to distribute nitrate horizontally across the hypolimnion from the three application locations. **Appendix 5B** provides an example of the daily SUNA data reports that were produced and issued by UFI to verify the application and distribution of the applied nitrate. **Appendix 5C** presents bubble plots prepared by UFI illustrating conditions across the hypolimnion at one meter (3 ft) above the lake bottom. The target nitrate-nitrogen concentration of 1.0 mg/L continued to be met in lower hypolimnion waters throughout the 2020 season, and minimal concentrations of methylmercury were observed in the lower waters during the stratified period. An unusually high methylmercury concentration of 1.78 nanogram per liter (ng/L) was reported at 18 meters depth on September 29. Methylmercury concentrations were characteristically low both prior to and following this date (**Appendix 5E**). Other water quality parameters including soluble reactive phosphorous and ammonia were not similarly affected, which suggests that it was not a case of sediment release caused by insufficient nitrate.

The 2020 applications of nitrate were terminated after October 14 based on an assessment of the size of the remaining nitrate pool in the hypolimnion and anticipated uptake of nitrate in lower waters of the lake through an estimated late turnover timeframe of early November. Approximately 72 MT of nitrate-nitrogen was present in the lake's hypolimnion on October 13, 2020 (**Figure 5.6**).

5.2.6 Significance of 2020 Nitrite Water Concentrations

Nitrite-nitrogen (NO_2-N) concentrations measured in Onondaga Lake from 2006 through 2020 have been compared to the New York State surface water quality standards (SWQS) established to protect warm water fish from effects of nitrite (**Figure 5.11**). The SWQS for nitrite (100 micrograms per liter [µg/L] as nitrogen) was exceeded at the 12-, 16-, and 18-meter depth during July. Exceedances of the SWQS for nitrite have occurred historically in the lower waters of the lake during early summer. However, low dissolved oxygen concentrations in the lower waters limit the exposure of fish to elevated nitrate concentrations during this period. Therefore, impacts to the fish population from exceedances at these depths are not expected. Elevated nitrite concentrations during these periods were caused by incomplete nitrification of ammonia. Nitrite concentrations did not exceed the standard at the 2-meter water depth of Onondaga Lake in 2020. Nitrate added to the hypolimnion is denitrified to dinitrogen gas (N_2). 2020 sampling results are included in the DUSR in **Appendix 5D**.

5.2.7 2020 Lake Water Mercury Concentrations

Table 5.4 summarizes total mercury and methylmercury concentrations in water samples collected in 2020 near the lake bottom at South Deep. Methylmercury was not significantly released from underlying sediment to lower hypolimnion waters during the summer of 2020 when deep lake waters would be prone to methylmercury release in the absence of nitrate addition. This lack of methylmercury release from SMU 8 sediment demonstrates that nitrate addition was again effective in 2020 as it has been since the nitrate addition program began in 2011. From the beginning of the 2020 nitrate applications on July 7 through turnover of the lake on October 26, the maximum concentration of methylmercury observed in the lower waters of the lake was 1.78 ng/L (where 1 ng/L is 0.000001 mg/L) at the 18-meter water depth on September 29 (Figures 5.12 and 5.13). This isolated and unusually high methylmercury concentration was not associated with low levels of nitrate. Figure 5.13 presents methylmercury and unfiltered total mercury results measured at South Deep over time at water depths of 2 meters (epilimnion), 12 meters (near the top of the hypolimnion), 16 meters (mid-to-lower hypolimnion), and 18 meters (bottom of the hypolimnion). Figure 5.13 shows the highest total mercury concentration (10.8 ng/L) was measured in the sample collected from the 2-meter water depth on November 18. As in past years, total mercury concentrations were elevated late in the season, although peak concentrations in 2020 did exceed most prior years (e.g., peaks of 11.4 ng/L in 2014, 5.9 ng/L in 2015, 5.09 ng/L in 2016, 3.34 ng/L in 2017, 3.58 in 2018, and 5.11 in 2019). Methylmercury concentrations remained low in 2020, with the exception of the single high value on September 29. Higher mercury concentrations during fall may be caused by wind driven resuspension of mercury contaminated sediments.

Concentrations of methylmercury at the 18-meter water depth at South Deep for the April-November time period from 2007 through 2020 are presented in Figure 5.14. Methylmercury concentrations were considerably lower in the lake's hypolimnion from 2011 through 2020 compared to prior years (Figures 5.14a and 5.15). However, the single high concentration from September 2020 is a conspicuous outlier. Low methylmercury concentrations in Onondaga Lake since 2011 are consistent with the higher nitrate concentrations (as a result of nitrate additions) compared to prior years. Methylmercury concentrations in Onondaga Lake hypolimnion water have declined dramatically aided by the addition of nitrate. With the noted single exception, methylmercury in the lower hypolimnion has been barely detectable since 2011 when nitrate additions began.

Table 5.5 summarizes dissolved mercury concentrations in water samples collected in 2020 at the 2-meter water depth at South Deep. Of the 14 dissolved mercury results for water samples collected at this depth in 2020, five exceeded the New York State SWQS for dissolved mercury (0.7 ng/L). One of the six results from the water samples collected during August, September, and October at the 16-meter depth in the lake's hypolimnion exceeded the New York State SWQS for dissolved mercury. The sample collected on September 22 from the 16-meter depth had a dissolved mercury concentration of 3.28 ng/L, which was flagged as an estimated concentration due to the dissolved mercury value being higher than the total mercury value. The highest dissolved mercury concentration measured in 2020 was 10.6 ng/L from a sample collected on November 18 at the 2-meter water depth. As a response to these concentrations, an evaluation of the data and field protocols was performed. It was noted that there were instances where field duplicate precision was unacceptable as discussed further in Appendix 5D; therefore, additional field duplicates will be collected in 2021 to further evaluate precision. Additionally, following internal discussions, improvements in field

procedures related to the storage, cleaning and pre-sample procedures were developed and will be implemented in 2021. Finally, a equipment blank study was performed over the winter of 2020 to evaluate if the sampler may have introduced any biases. However, data collected as part of this study were all non-detects. Data collected in 2021 will be monitored on an ongoing basis, with any exceedances discussed with NYSDEC.

5.2.8 Other Related 2020 Lake Monitoring

Additional monitoring completed in 2020 included laboratory analyses for soluble reactive phosphorus in deep waters that are anoxic during the summer period. An additional benefit to maintaining nitrate levels in the hypolimnion during periods of anoxia is that release of phosphorus from deep lake sediments has been reduced (**Figure 5.16**). The presence of nitrate in waters near the lake bottom prevents the reduction of iron oxyhydroxides that is typical in anaerobic surface sediments. This, in turn, reduces the release of phosphorus bound to those compounds. The same mechanism preventing release of phosphorus from anaerobic lake sediment is thought to control the release of methylmercury from sediments (Matthews et al. 2013).

The full data set for total mercury and methylmercury analysis in zooplankton, which are collected to as part of the tissue monitoring program to assess ongoing recovery, is presented in Section 3 of this report.

5.3 Summary of 2020 Nitrate Addition Results and Recommendations

5.3.1 2020 Results Summary

Results from the seventh year of full-scale nitrate addition (2020) showed successful delivery of sufficient quantities of nitrate to the lower hypolimnion of Onondaga Lake during summer stratification to meet the objective and thereby minimize methylmercury concentrations in deep waters of the lake. Nitrate-nitrogen concentrations were maintained at levels sufficient to inhibit the release of methylmercury from profundal zone sediments. Methylmercury release into the water column from profundal zone sediment continues to be effectively controlled. Five of the 14 dissolved mercury results for water samples collected at the 2-meter water depth in 2020 exceeded the New York State SWQS for dissolved mercury (0.7 ng/L). The cause of these exceedances is not known. Note that nitrate addition is intended to control methylmercury concentrations in the hypolimnion but not dissolved mercury concentrations in the epilimnion.

A total of 77.61 MT of nitrate-nitrogen were added to the hypolimnion of Onondaga Lake between July 7 and October 14, 2020. Sediment nitrate demand in the summer of 2020 was approximately 0.8 MT per day, equal to the nitrate demand of 0.8 MT per day included in the earlier nitrate addition design report on which applications of nitrate, which began in 2011, were based. Applications of nitrate continued uninterrupted at a typical pace of two to three applications per week.

5.3.2 Recommendations and 2021 Nitrate Addition

Part of the ongoing assessment of the nitrate addition program is to make it more effective and efficient. With this aim, a fixed application station was piloted at the South1 application station in 2018. The pilot station successfully delivered nitrate to the deep-water areas in the vicinity of the Lake. In 2019, fixed application stations were added at the South2 and North locations. It is recommended that this method be used in 2021. The traditional application method (through 2018) uses a manifold of flexible hosing that is assembled and disassembled daily. This application method will be maintained as a backup.

Upgrades to Metro were completed in 2019, and nitrification of ammonia in wastewater was online for the 2020 season and is expected to continue to be operational moving forward into 2021. While variation in spring runoff and unforeseen circumstances will still play a role, spring conditions in 2020 were more like those seen from 2011 through 2017, and nitrate addition was not necessary as early or often as in 2018 and 2019. It is expected that conditions in 2021 will be similar to conditions seen in 2020. Monitoring in 2021 should commence as usual in April and May to inform the start of injections. The goal of nitrate additions in 2021 will continue to be to maintain nitrate above 1.0 mg/L in the lower hypolimnion.

SECTION 6 CAP MONITORING

Cap physical monitoring was conducted in 2020 to verify that the cap remains protective. Provided below are the detailed activities and results from the 2020 physical monitoring.

Consistent with the OLMMP, the 2020 monitoring program included a focused rather than a comprehensive physical monitoring event. This included physical monitoring in the MPCs, MERCs, and SMU 8 TLCs and direct application areas included in the design revisions. An additional investigation was also conducted in RA-E Zone 2 to further evaluate anomalies from the 2019 monitoring. Results from the monitoring in 2020 and the comprehensive monitoring in 2019 verify that the cap remains physically stable, with no significant loss of cap material in any of the capped areas. Consistent with the OLMMP, monitoring in 2021 will include supplemental physical monitoring to address anomalies found in 2019 and 2020. The proposed 2021 physical monitoring scope, including recommended minor modifications to the physical monitoring program from that specified in the OLMMP, are detailed below.

Consistent with the monitoring schedule specified in the OLMMP, chemical monitoring was not completed in 2020. Comprehensive chemical monitoring of the caps will be implemented in 2022, as specified in the OLMMP.

6.1 Physical Monitoring

Consistent with the scope and schedule detailed in the OLMMP, focused physical monitoring of the cap and visual inspection of the WB 1-8 shoreline were implemented in 2020. Results from 2020 monitoring as well as the 2019 comprehensive physical monitoring indicate that there has been no significant loss of cap material in any of the capped areas. However, supplemental 2021 data collection beyond what is specified in the OLMMP is recommended for portions of RAs-A, C, D, and E to verify this. Supplemental physical monitoring recommended based on the results from the 2019 physical monitoring is detailed in the 2019 Onondaga Lake Monitoring and Maintenance Report. Supplemental physical monitoring recommended based on the results from the 2020 physical monitoring is detailed in Section 6.1.4 below. The recommended 2021 cap monitoring scope which includes supplemental physical monitoring recommended based on the results from both the 2019 and 2020 physical monitoring, is detailed in the 2021 Onondaga Lake Scope memo.

Specific monitoring activities that were conducted in 2020 include:

- Shoreline inspections and photographic documentation on foot, by boat, and by aerial drone of capped areas and the WB 1-8 shoreline
- Physical probing
- Bathymetric surveys of the MPCs, MERCs, SMU 8 TLCs and Direct Application Areas

Results of these routine physical monitoring activities are discussed in detail in Sections 6.1.2 through 6.1.4. **Figures 6.1 through 6.5** show the bathymetric survey areas and physical probing locations completed in 2020, including additional activities beyond those specified in the OLMMP as discussed below in Section 6.1.1.

The monitoring program also includes event-based monitoring if any of three extreme events occur:

- A 50-year or greater wind-generated wave event
- A 50-year or greater tributary flow event
- A seismic event measuring 5.5 or higher within 30 miles of Onondaga Lake

As detailed in **Appendix 6A**, none of these conditions have been exceeded since cap construction was completed. The Honeywell team is also not aware of any human activities during the reporting period that may have impacted the cap and/or other components of the remedy. Therefore, no event-based cap monitoring has been required.

6.1.1 Modifications from Planned Work Scope

Modifications to the OLMMP physical monitoring work scope are documented in the 2020 Scope Memorandum included in **Appendix 1A**. These modifications were added in order to clarify conditions observed during the 2019 monitoring, and include the following:

- Bathymetric survey of RA-E Zone 2 (fine gravel) to further evaluate anomalies in core thickness measurements from the 2019 monitoring.
- Completion of supplemental probing in RA-E originally planned for 2019, as shown in Figure 6.32 of the 2018 Annual and Comprehensive Monitoring and Maintenance Report. This supplemental probing was not completed in 2019 as intended, as the probing rods were damaged during field activities and could not be replaced prior to the conclusion of the 2019 field activities.

There were no deviations from the planned work scope specified in the 2020 Scope Memorandum.

6.1.2 Shoreline Inspection Result

Inspections were performed in 2020 by boat, by foot from the shoreline, and using an aerial drone (also referred to as a small unmanned aerial system) to document the integrity of the shoreline areas where remedial activities were implemented. Inspections were completed when water levels were at elevation 363.5 ft or less (North American Vertical Datum of 1988 [NAVD88]). The areas inspected included shoreline capping areas in RAs-A, B, C, D, and E, the Outboard Area (including the berms), the WB 1-8 connected wetland (including the berms), the Ninemile Creek spits, the WB 1-8 shoreline stabilization area, and the capped cultural resources located in the shallow areas of RA-E. Areas that could not be adequately inspected from the shoreline were inspected from a boat. Photographs taken in 2020 were limited to identification/photograph documentation of any noted anomalies, consistent with the OLMMP and with NYSDEC concurrence.

At the time of the 2020 comprehensive shoreline inspection, no signs of significant erosion or other potential significant issues were noted. However, there were small areas where minor disturbances were noted, as listed below:

- RA-D Shoreline, east of crane pad area. Early in 2019, visual observations noted loss of habitat material along a small portion of the shore in this area. Additional cap material was placed in this area, as detailed in Section 6.1.7 of the Draft 2019 Annual Monitoring and Maintenance Report. During the 2020 inspection, it was noted that parts of the upper layer of finer grained

new habitat material had eroded. However, the larger underlying material remains intact, and this erosion was expected and does not impact the overall effectiveness of the cap.

- RA-D Outboard West. Potential topsoil erosion was observed along a small portion of this area (approximately 50 ft^2), between Berms B and C, which was first noted during the 2019 shoreline inspection. There are portions of this area that are not protected by the berms, so some loss of topsoil is expected and does not impact the overall effectiveness of the cap. No probing was done in this area and the cap surface was below the water surface preventing visual inspection of the cap surface. However, the cobble protective edge on the lake side of this area was intact, indicating the underlying coarse gravel erosion protection layer was not impacted. Additional probing will be performed in this area during the 2022 cap monitoring program.

Ground-level and aerial photographs from 2020 are included in electronic format in **Appendices 6B and 6C**, respectively.

6.1.3 Physical Probing Results

Consistent with the OLMMP, coarse gravel- or gravelly cobble-sized armor stone are too coarse to core through. Therefore, bathymetric surveys in conjunction with cap probing is used to verify the presence of these materials. Cap probing was implemented in 2020 consistent with the OLMMP, as well as additional supplemental probing in RA-E. This supplemental probing was originally planned for 2019, as detailed in the 2018 Annual and Comprehensive Monitoring and Maintenance Report (Parsons 2020b), but could not be completed as intended, as the probing rods were damaged during field activities and could not be replaced prior to the conclusion of the 2019 field activities.

Probing was conducted along the transects shown in **Figures 6.1 through 6.5** by manually tapping the cap at 25-ft intervals with a steel plate attached to rods. If an anomaly such as soft material is encountered along the transect, the location is flagged via GPS for additional review. Due to the nature of the steel plate used and the depth of water along the transects, probing can only determine the presence of soft material, and is not useful for an accurate measurement of the thickness of the layer of material or whether gravel is present underneath. In probing areas where the water depth, water clarity and/or vegetation cover did not interfere, the presence of the coarse substrate was also verified to the extent possible based on visual observations from the water surface. Probing and visual inspection were also conducted directly adjacent to shoreline tributaries and outfalls to verify the cap remains physically stable at these locations.

The presence of coarse substrate was consistently verified along the probing transects completed in 2020 in areas with fine gravel, coarse gravel, and cobble habitat/erosion protection layers, with one exception. Some soft material was periodically noted during probing transects down the centerline of the mouth of Ninemile Creek and adjacent to the topsoil area in RA-A. The presence of this material was first noted in 2019, as detailed in the 2019 Monitoring and Maintenance Report. Based on a comparison of the 2019 survey results in this area to the 2018 survey and the as-built survey, the soft material corresponds with areas of sediment deposition, rather than erosion of cap material. Visual observations of this material verified that it appeared to be topsoil or organic depositional sediments rather than the chemical isolation layer sand.

6.1.4 Bathymetry Survey Results

As part of the 2020 physical monitoring, comprehensive bathymetric surveys of the MPCs, MERCs, and SMU 8 TLCs were conducted, consistent with methods and coverage areas specified in the OLMMP. Additional bathymetric survey was also conducted in RA-E Zone 2 (fine gravel) to further evaluate anomalies in core thickness measurements from the 2019 monitoring. The surveys were conducted on transect lines running perpendicular to the slope and spaced 30 ft apart (**Figures 6.1 through 6.5**), repeating every other survey line that was established during the collection of as-built data during construction. In areas that were too shallow for boat-based surveying (e.g., where the cap meets the shore), elevations were manually surveyed by wading and using conventional survey techniques.

The bathymetric surveys collected in 2020 have been compared to the as-built and 2019 bathymetries for the specified survey areas, as shown in **Figures 6.6 through 6.13**. Based on a comprehensive review of the 2020 bathymetry survey and probing results, as well as the physical monitoring conducted in 2019, there has been no significant loss of cap material in any capped area and the cap remains physically stable. A discussion of physical monitoring results for each of the areas surveyed in 2020 is provided below.

Remediation Area A

There was no bathymetric survey completed in RA-A in 2020.

Remediation Area B

As shown in **Figure 6.2**, bathymetric survey of the MPCs in RA-B was conducted in 2020, as specified in the OLMMP. As shown in **Figures 6.6 and 6.7**, there was minimal bathymetric changes in these areas between 2019 and 2020, and bathymetry changes between the as-built and 2020 that are greater than 0.5 ft. in RA-B are generally attributable to settlement of the underlying sediment as a result of the weight of the cap. Core samples collected in 2019 verified that cap thicknesses in these areas were consistent with expectations, as detailed in the 2019 Monitoring and Maintenance Report. No supplemental investigation activities are proposed in RA-B based on the physical monitoring results from 2020.

Remediation Area C

As shown in **Figure 6.3**, bathymetric survey of the MPCs in RA-C and adjacent SMU-8 TLC was conducted in 2020, as specified in the OLMMP. As shown in **Figure 6.9**, there were minimal changes in bathymetry between 2019 and 2020, with the exception of a small anomalous area near the edge of the MPC monolayer cap in cap management unit (CMU) 16. Between 2020 and the as-built, bathymetry changes greater than 0.5 ft. in RA-C are generally attributed to settlement of the underlying sediment as a result of the weight of the cap, as shown in **Figure 6.8**, which was expected in the design. Core samples collected in 2019 verified that cap thicknesses in these areas were consistent with expectations, as detailed in the 2019 Monitoring and Maintenance Report. Supplemental physical cores are proposed for 2021 in RA-C to investigate the anomalies in the 2020 bathymetry in CMA 16, as shown in **Figure 6.14**.

Remediation Area D

As shown in **Figure 6.4**, bathymetric survey of the MPCs in RA-D and adjacent SMU-8 TLC was conducted in 2020, as specified in the OLMMP. As shown in **Figure 6.11**, there was minimal bathymetric change in these areas between 2019 and 2020, with the exception of one anomaly near the edge of the MPC area in CMU 44. Bathymetry changes between 2020 and the as-built that are greater than 0.5 ft in RA-D are generally attributed to settlement of the underlying sediment as a result of the weight of the cap, as shown in **Figure 6.10**, which was expected in the design.

As detailed in the 2019 Monitoring and Maintenance report, with minor exceptions at two locations, all multi-layer cap thickness measurements collected in 2019 in RA-D met or exceeded the minimum cap thickness expectations specified in the OLMMP, and mono-layer cap thicknesses in RA-D were consistent with expectations considering construction variability and the average thickness-based goal. As detailed in the 2019 Monitoring and Maintenance Report, supplemental coring has been proposed for 2021 to evaluate the core locations that were lower than expectations. Additional supplemental coring is also proposed for 2021 to further evaluate the small anomalies in 2020 bathymetry in RA-D, as shown in **Figure 6.15**.

Remediation Area E

As shown in **Figure 6.5**, 2020 bathymetric survey in RA-E was conducted in the MERCs and SMU 8 TLCs, as specified in the OLMMP. Additional supplemental survey was also conducted in Zone 2 to further evaluate anomalies in core thicknesses collected in 2019. As shown in **Figures 6.12 and 6.13**, there was minimal bathymetric change in these areas between 2019 and 2020, and bathymetric changes between 2020 and the as-built that are greater than 0.5 ft. in RA-D are generally attributable to settlement of the underlying sediment as a result of the weight of the cap, which was expected in the design. As detailed in the 2019 Monitoring and Maintenance Report, supplemental cores and video probes will be collected in 2021 to address anomalies in core thickness measurements collected in 2019. No additional supplemental physical monitoring in RA-E is recommended based on the results of the 2020 physical monitoring.

Remediation Area F

There was no bathymetric survey completed in RA-F in 2020.

6.1.5 RA-C-2A Additional Material Placement Follow-up

As documented in the 2019 Monitoring and Maintenance Report, the habitat/erosion protection layer (fine gravel) thickness measurements in Model Area RA-C-2A (4 to 10 ft) for cores collected in 2018 were less than the target thickness goals. An additional investigation was conducted in 2019, which included coring, video probing, and a diver inspection. While the overall cap continues to maintain a high level of protectiveness, the investigation results indicated that there were very small areas where the fine gravel was not placed as intended during construction, likely due to caution related to over-placement of materials in this area that could have impacted the underlying sediment stability. As a result of the investigation, a plan was developed to place additional material on the areas of the cap where the measured cap thickness was less than the target, as approved by the NYSDEC, which was implemented in the late fall of 2019. Achievement of placements goals was confirmed by collecting duplicate cores throughout the placement area.

The additional cap material placement activities in 2019 in RA-C-2A were implemented in the late fall, after bathymetric survey had concluded for the year. As part of the 2020 physical monitoring activities specified in the OLMMP, bathymetric survey was collected in the MPCs, which included Model Area RA-C-2A. As shown in **Figures 6.8 and 6.9**, the cap in this area has maintained stability after the placement of the additional material and there has been no significant material loss, as the cap elevations are within expectations.

To further verify the gravel substrate remains in place in the area of additional cap material placement in Model Area RA-C-2A, a supplemental probing transect will be completed in this area in 2021, as detailed in the 2019 Monitoring and Maintenance Report. Bathymetric survey will also be collected in this area again in 2022 as part of the routine physical monitoring specified in the OLMMP.

6.1.6 RA-D Shoreline Cap Material Placement

As documented in the 2019 Monitoring and Maintenance Report, focused bathymetric survey was completed along a small portion of the RA-D Outboard Area shoreline to evaluate erosion of the fine grain habitat material that had been observed. Based on the bathymetry and physical observations, it was concluded that bathymetric changes were due in part to settlement, but primarily due to loss of the fine grain habitat material. There was minimal loss of the underlying erosion protection material, therefore the cap maintains high level of protectiveness.

To be conservative and minimize the potential for additional material loss, the lost material was replaced in the summer of 2019 with a coarse rounded cobble that would better resist erosion. Fine gravel was also placed above the water line to fill the void spaces. Material thickness was verified based on a comparison of pre-placement and post-placement elevations.

To verify that the additional material has remained in place, elevation measurements will be conducted in this area in 2021 for comparison to the elevation measurements that were taken shortly after the material was placed. Bathymetric survey will also be collected in this area in 2022 as part of the routine physical monitoring specified in the OLMMP.

6.1.7 Summary of 2020 Physical Monitoring Results and Recommendations for 2021 Monitoring

Results from the 2020 physical monitoring program in conjunction with the 2019 comprehensive physical monitoring program verify that the caps remain physically stable. Based on the monitoring results, there has been no significant loss of cap material in any of the capped areas.

Consistent with the OLMMP, the 2021 physical monitoring of the cap will consist of probing and visual inspection of the areas specified in the OLMMP. It will also include the annual shoreline inspection and aerial drone photography as specified in the OLMMP. Any signs of potential erosion along WB 1-8 stabilized shoreline will be photographed and noted during the shoreline inspection.

As detailed above, additional physical monitoring is recommended for 2021, based on the results of the 2019 and 2020 monitoring programs. Revisions to the 2021 cap physical monitoring program from what is specified in the OLMMP consist of:

- Completion of supplemental coring in RA-A, as recommended in the 2019 Monitoring and Maintenance Report
- Completion of supplemental coring in RA-C based on the 2020 bathymetry results, as shown in Figure 6.14
- Completion of a supplemental probing transect in RA-C, as recommended in the 2019 Monitoring and Maintenance Report
- Completion of supplemental coring in RA-D based on the 2020 bathymetry results, as shown in Figure 6.15
- Completion of elevation measurements along the RA-D shoreline where additional material was placed in 2019, as recommended in the 2019 Monitoring and Maintenance Report
- Completion of supplemental coring and videoprobing in RA-E, as recommended in the 2019 Monitoring and Maintenance Report

The recommended 2021 cap monitoring scope, including supplemental physical monitoring recommended based on the results from both the 2019 and 2020 physical monitoring, is detailed in the 2021 Onondaga Lake Scope memo. For each 2021 coring locations, a minimum of two cores will be collected. If the measured thicknesses are less than the target, additional cores may be collected, as well as additional step-out cores and/or videoprobing, to be determined in consultation with the NYSDEC.

6.2 Chemical Monitoring

Consistent with the specifications of the OLMMP, chemical monitoring was not conducted in 2020. Comprehensive chemical monitoring of all cap areas will be conducted in 2022. Based on the results of chemical and physical monitoring in 2019, physical monitoring in 2020, and specifications in the OLMMP, supplemental chemical monitoring is not proposed for 2021.

6.3 Shoreline Hydraulic Control System Operation

As part of the Interim Remedial Measures (IRMs) associated with adjacent contaminated sites, shoreline subsurface barrier walls and/or groundwater collection systems have been installed directly adjacent to several capped areas within the lake and adjacent wetlands. Successful hydraulic containment by these systems limits groundwater upwelling in adjacent lake and wetland areas. It is therefore an important factor in ensuring the caps achieve their established performance criteria. Groundwater flows through three zones in the aquifer: shallow, intermediate, and deep. A clay layer separates the intermediate and deep zones. Operational and monitoring data from the hydraulic containment systems are used to demonstrate that groundwater from the shallow and intermediate zones is being successfully captured. Thus, the only potential source of groundwater upwelling through the cap is from the deep zone through the underlying clay layer. This was the design basis used to generate the groundwater upwelling rates for cap modeling for the final design. Hydraulic containment systems include:

- A shoreline groundwater collection system that has been implemented as part of the WBs 1-8 IRM

- Shoreline barrier walls and groundwater collection systems that have been implemented as part of the Willis/Semet and WB B IRMs (Parsons 2018a)

Infiltration of impacted groundwater to Onondaga Lake along the southeastern shoreline has been mitigated as part of the Willis/Semet and WB-B IRMs through construction of a control system that includes a sheet pile barrier wall and a groundwater collection system. The hydraulic barrier wall is the primary groundwater control mechanism and extends a minimum of 3 ft into the clay layer present at depths ranging from 35 to 70 ft below grade. As documented in Honeywell Lakeshore Upland Sites Performance Verification 2017 Annual Report (Parsons and O'Brien and Gere 2018), the ability to contain groundwater and in general maintain an inward hydraulic gradient has been demonstrated for these systems and is expected to continue in perpetuity. Successful operation of the system is ongoing, including finalization of the 2018, 2019 and 2020 annual reports.

The WB 1-8 IRM includes the Eastern and RA-A shoreline groundwater collection systems to control shallow and intermediate groundwater discharges to Onondaga Lake. As documented in *2015 and 2016 Source Control Summary for the Onondaga Lake Bottom Subsite* (Parsons and O'Brien and Gere 2016), data through the end of March 2016 indicated general achievement of hydraulic control for these systems, with periodic exceptions during scheduled maintenance, extreme weather conditions, and elevated lake levels. Since then, numerous system upgrades and optimization activities have been implemented which have resulted in improved system performance. NYSDEC has been updated regularly on the performance of and upgrades to these systems. Demonstration of consistent performance has been challenging along a portion of the system that is directly adjacent to the capped area in RA-A. Therefore, peeper locations A-30 and A-31 directly adjacent to the RA-A shoreline groundwater collection systems were added to the 2019 cap monitoring program to verify that the cap adjacent to this portion of the hydraulic containment system remains protective. With the exception of minor detections of toluene and benzene (at less than 0.5 percent of the cap performance criteria), all analytes were non-detect for these two peepers. These peeper locations will continue to be sampled in future chemical monitoring events.

Monitoring of upwelling velocities in the capped area adjacent to the hydraulic containment system was also implemented. In July 2019, ultrasonic seepage meters were deployed at four locations (Stations A through D) in RA-A to quantify groundwater upwelling in the area. A duplicate seepage meter (Station A′) was deployed at one of the locations in order to help understand the quality of data received. A second round of upwelling velocity measurements was implemented in 2021. Results from both rounds of upwelling velocity measurements will be provided to NYSDEC in a comprehensive report following completion of the second round of velocity measurements.

6.4 Institutional Controls

As specified in the OLMMP, institutional controls are included as part of the long-term monitoring and maintenance program for the lake to protect the integrity of the cap and ensure long-term protectiveness of human health and the environment. Specifically, institutional controls have been implemented to:

- Prevent unacceptable exposure to residual contamination within the lake

- Prevent recreational boaters from accidently hitting any navigational hazards created by capping and restoration components of the remedy
- Prevent damage to the cap from such activities as navigational dredging

The specific institutional controls detailed in the OLMMP and the status of these institutional controls are detailed below.

- New York State Department of Health (NYSDOH) fish consumption advisories. NYSDOH reviews fish consumption advisories and updates on a regular basis. These advisories remain in place and are consistent with those listed in the OLMMP. In 2017, the City of Syracuse and Onondaga County posted signs in numerous locations along the shore of Onondaga Lake regarding the presence of consumption advisories and where to find additional information. Honeywell is not aware of any public outreach activities relating to fish consumption advisories since the finalization of the OLMMP.
- NYSDEC and U.S. Army Corps of Engineers (USACE) permitting process to restrict actions that may disrupt the cap or SMU 8 sediment. This permitting process remains in place, and there have been no activities that Honeywell is aware of that have disrupted the cap or SMU 8 sediment. Honeywell is currently working with the NYSDEC to finalize the Onondaga Lake Site Management Plan, which will provide additional details regarding institutional controls that will be implemented to prevent actions that may disrupt the cap or SMU 8 sediment.
- Recreational boating buoys. The New York State Office of Parks, Recreation and Historic Preservation maintains navigational buoys in Onondaga Lake to warn boaters of hazards in water less than 4 ft deep and beyond 100 ft from shore. This includes buoys associated with shallow water resulting from capping activities in a small portion of RA-A, which have been deployed annually since 2016. Deployment has been verified annually during cap monitoring activities.
- Navigational charts. Updated (post-capping) bathymetric survey results were provided in May 2017 to the National Oceanic and Atmospheric Administration (NOAA) to allow them to update the Navigational Chart for Onondaga Lake (currently included as Chart Number 14786 page 33 for the Small-Craft Book Chart for the New York State Canal System). NOAA updated the charts accordingly on February 11, 2020.

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TABLES

TABLE 2.1 2020 VEGETATION DATA SUMMARY MOUTH OF NINEMILE CREEK RESTORATION AREA

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Relative Cover
Typha latifolia[4]	Broadleaf cattail	OBL	28.0%
Ceratophyllum demersum	Coontail	OBL	9.4%
Elodea canadensis	Common waterweed	OBL	8.6%
Stuckenia pectinata	Sago pondweed	OBL	8.4%
Pontederia cordata	Pickerelweed	OBL	4.9%
Spartina pectinata	Prairie cordgrass	FACW	4.7%
Leersia oryzoides	Rice cutgrass	OBL	4.4%
Schoenoplectus tabernaemontani	Softstem bulrush	OBL	4.3%
Heteranthera dubia	Water stargrass	OBL	4.2%
Nitellopsis obtusa	Starry stonewort	OBL	3.8%
Nuphar lutea	Yellow pond-lily	OBL	3.1%
Echinochloa spp.	Barnyardgrass	FACW	2.7%
Potamogeton illinoensis	Illinois pondweed	OBL	2.5%
Cyperus bipartitus	Shining flat sedge	FACW	2.0%
Sparganium eurycarpum	Giant burreed	OBL	1.1%
Schoenoplectus acutus	Hardstem bulrush	OBL	1.0%
other species (<1% rel. cover, 48 species)			6.9%
		Total	100%

[1] Botanical nomenclature follows Mitchell and Tucker (1997)

[2] Wetland Indicator Status nomenclature:

Obligate Wetland (OBL): occurs almost always (estimated probability >99%) in wetlands.
Facultative Wetland (FACW): usually occurs in wetlands (estimated probability 67%-99%), but is occasionally found in non-wetlands.
Facultative (FAC): equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
Facultative Upland (FACU): usually occurs in non-wetlands (estimated probability 67%-99%), but is occasionally found in wetlands (estimated probability 1%-33%).
Obligate Upland (UPL): occurs almost always (estimated probability >99%) in non-wetlands.

[3] References for Wetland Statuses throughout document from the following:

http://plants.usda.gov

https://gobotany.newenglandwild.org

[4] Broadleaf cattail hybridizes readily with narrowleaf cattail and the hybrid can be challenging to distinguish from broadleaf cattail. Narrowleaf cattail has been documented in the qualitative surveys and there are also nearby populations outside the restoration area. Therefore, it is likely that some degree of hybridization is occuring.

TABLE 2.2 2020 VEGETATION DATA SUMMARY, WASTEBED B/HARBOR BROOK OUTBOARD AREA

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Relative Cover
Typha latifolia[4]	Broadleaf cattail	OBL	37.1%
Stuckenia pectinata	Sago pondweed	OBL	7.5%
Myriophyllum spp.	Watermilfoil	OBL	4.4%
Elodea canadensis	Common waterweed	OBL	3.6%
Salix nigra	Black willow	OBL	3.2%
Ceratophyllum demersum	Coontail	OBL	2.8%
Pontederia cordata	Pickerelweed	OBL	2.5%
Cyperus esculentus	Yellow nutsedge	FACW	2.1%
Nymphaea odorata	American white waterlily	OBL	2.0%
Leersia oryzoides	Rice cutgrass	OBL	1.9%
Solidago canadensis	Canada goldenrod	FACU	1.9%
Panicum virgatum	Switchgrass	FAC	1.9%
Echinochloa spp.	Barnyardgrass	FACW	1.9%
Schoenoplectus tabernaemontani	Softstem bulrush	OBL	1.8%
Heteranthera dubia	Water stargrass	OBL	1.3%
Nuphar lutea	Yellow pond-lily	OBL	1.3%
Lemna minor	Common duckweed	OBL	1.2%
Spartina pectinata	Prairie cordgrass	FACW	1.2%
Cornus amomum	Silky dogwood	FACW	1.1%
Phalaris arundinacea	Reed canary grass	FACW	1.0%
other species (<1% rel. cover, 110 species)			18.3%
		Total	100%

[1] Botanical nomenclature follows Mitchell and Tucker (1997)

[2] Wetland Indicator Status nomenclature:

Obligate Wetland (OBL): occurs almost always (estimated probability >99%) in wetlands.
Facultative Wetland (FACW): usually occurs in wetlands (estimated probability 67%-99%), but is occasionally found in non-wetlands.
Facultative (FAC): equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
Facultative Upland (FACU): usually occurs in non-wetlands (estimated probability 67%-99%), but is occasionally found in wetlands (estimated probability 1%-33%).
Obligate Upland (UPL): occurs almost always (estimated probability >99%) in non-wetlands.

[3] References for Wetland Statuses throughout document from the following:

http://plants.usda.gov

https://gobotany.newenglandwild.org

[4] Broadleaf cattail hybridizes readily with narrowleaf cattail and the hybrid can be challenging to distinguish from broadleaf cattail. Narrowleaf cattail has been documented in the qualitative surveys and there are also nearby populations outside the restoration area. Therefore, it is likely that some degree of hybridization is occuring.

TABLE 2.3 2020 TREE CONDITION SURVEY, WASTEBED B/HARBOR BROOK OUTBOARD AREA

Number of Trees	Species[1]	Condition					
		Overall Condition					
		Excellent	Very Good	Good	Poor	Very Poor	Dead/Removed
17	American sycamore (*Platanus occidentalis*)	15	1	1	0	0	0
23	Black willow (*Salix nigra*)[2,3]	23	0	0	0	0	0
6	Northern white cedar (*Thuja occidentalis*)	4	1	0	1	0	0
7	Quaking aspen (*Populus tremuloides*)	5	2	0	0	0	0
24	Red maple (*Acer rubrum*)[2]	11	7	5	0	1	0
1	River birch (*Betula nigra*)	1	0	0	0	0	0
2	Silver maple (*Acer saccharinum*)	2	0	0	0	0	0
23	Swamp white oak (*Quercus bicolor*)	18	4	1	0	0	0
103	**Total trees & observed condition**	**79**	**15**	**7**	**1**	**1**	**0**

[1] Scientific names follow the New York Flora Atlas (Weldy et al. 2017).

[2] Installed in 2018 at a higher than 1:1 ratio with smaller sized potted trees. Trees were planted in close proximity to each other. The tree with the best overall condition is recorded in the table.

[3] Installed in 2020 at a higher than 1:1 ratio with smaller sized potted trees. Trees were planted in close proximity to each other. The tree with the best overall condition is recorded in the table.

TABLE 2.4 2020 MITIGATION WETLAND ACREAGES

MITIGATION AREA		MONITORING YEAR	CURRENT ACREAGE
Wetland Acreage			
Ninemile Creek Spits		4	2.52[1]
Wastebeds 1- 8	Perched wetland A	5	2.87[2,3]
	Perched wetland B		3.79[2,3]
	Perched wetland C		0.53[2,3]
	Wastebeds 1-8 Connected Wetlands	5	0.29[3,4,5]
Wastebed B/Harbor Brook Outboard Wetland		3	10.8[6]
		Overall Mitigation Acreage Required	19.5[7]
		2020 Wetland Acreage	20.80
Open Water Acreages			
Wastebeds 1-8 Connected Wetlands		5[10]	2.3[3,4]
Wastebed B/Harbor Brook Outboard Area		3	3.7[8]
		Overall Acreage Required	2.3[9]
		2020 Open Water Acreage	6.0

[1] Estimated during a year three formal wetland survey in 2019 Represents contiguous wetland acreage in the area of the original spits connected to the shoreline.

[2] Calculated during a formal wetland delineation in 2019.

[3] Wastebeds 1-8 Mitigation Wetland Delineation Report (Ramboll, 2023).

[4] Calculated during a formal wetland delineation in 2020.

[5] Additional delineated acreage in excess of the designed 2.3 acres required to account for open water loss within the Wastebeds 1-8 Connected Wetlands.

[6] Estimated during a year three formal wetland survey in 2020.

[7] Mitigation areas taken from Table 7.5A of the Onondaga Lake Monitoring and Maintenance Plan

[8] Estimated from the 2020 acreages of the Harbor Brook Channel and the area of unconsolidated bed within the Wastebed B/Harbor Brook Outboard Area boundary (Figures 2.2 and 2.3).

[9] Mitigation areas taken from Table 7.5B of the Onondaga Lake Monitoring and Maintenance Plan (Parsons, 2018.)

[10] Wastebeds 1-8 Connected Wetlands were created to mitigate for open water loss.

TABLE 2.5 SPECIES RICHNESS OF THE FISH COMMUNITY IN 2020

	Lakewide Total	Remediated Areas	Reference Areas
Baseline (2008-2011)	40	37	36
Construction (2012-2016)	38	33	36
2017	41	39	34
2018	42	37	40
2019	45	40	39
2020	36	33	33

TABLE 2.6 2020 MAINTENANCE SUMMARY MOUTH OF NINEMILE CREEK AND WASTEBED B/HARBOR BROOK OUTBOARD RESTORATION AREAS

MONTH	TASK	SITE	DESCRIPTION
Action Items and Maintenance Efforts			
June and September/October	Invasive Species Control	Mouth of Ninemile Creek, Wastebed B/Harbor Brook Outboard Area	Applications of the herbicide Rodeo® to invasive species were carried out
July	Mechanical Removal of Water Chestnut	Restoration Area A and E	Hand pulled water chestnut out of lake
June	Large Tree Replacement	Wastebed B/Harbor Brook Outboard Area	Replaced 5 dead trees noted in the 2019 survey
Supplemental Plantings and Seeding			
April/May	Bare Root Plantings[1]	Mouth of Ninemile Creek, Wastebed B/Harbor Brook Outboard Area	Installed bare root trees
May-August	Enhancement Plantings[1]		Planted herbaceous plugs in sparsely vegetated areas

[1] Quantities and species can be found in Table 2B.6.

TABLE 3.1 PERFORMANCE CRITERIA (MERCURY) AND TARGET CONCENTRATIONS (ORGANIC CHEMICALS)

	Human Health	Ecological[a]
Performance Criteria[b]		
Mercury (mg/kg)	0.2 to 0.3[c]	0.14[d] for small and large prey fish
Target Concentrations		
PCBs (mg/kg)	0.04 to 0.3[e]	0.19[d] for small and large prey fish
Dioxin/furan TEQ (ng/kg)	1.3 to 4[f]	NA
DDT and Metabolites (mg/kg)	NA	0.049[g] for small prey fish 0.14[h] for large prey fish

Notes:

- Contaminant concentrations in fillet samples of sportfish (i.e., identified as Smallmouth Bass, Walleye, Pumpkinseed, and Common Carp in the OLMMP) are compared to performance criteria and target concentration ranges for protection of human health.
- Contaminant concentrations in 1) whole body samples of large prey fish, 2) composite whole body samples of small prey fish are compared to performance criteria and target concentrations for protection of ecological receptors, and 3) whole-body concentrations in sportfish of appropriate sizes calculated from fillet concentrations. The OLMMP identifies White Sucker and Banded Killifish for large and small prey fish, but states that other comparable species may be substituted if these species are difficult to obtain.
- Concentrations are on a wet-weight basis.
- While not collected as prey fish, remedial goals and target concentrations may be compared to contaminant concentrations in whole body sportfish (i.e., specifically Smallmouth Bass, Walleye, Pumpkinseed, and Common Carp in the OLMMP) where fillet data is converted to whole body data using "conversion factors developed in the Onondaga Lake Baseline Ecological Risk Assessment (BERA) (i.e., 0.7 for mercury, 2.5 for PCBs, and 2.3 for DDTs and hexachlorobenzene) (TAMS, 2002b)," For these calculations, fish with lengths 180-600 mm and 30-180 mm are compared to goal and target concentrations for large and small prey fish, respectively.

NA – not applicable. Dioxin/furans and DDT were not identified as posing risk to ecological receptors and human health, respectively.

a – Protection of ecological receptors (wildlife) based on the exposure assumptions from the Onondaga Lake Baseline Ecological Risk Assessment (BERA) (TAMS, 2002b). Ecological performance criteria and targets based on lowest observed adverse effect levels presented in Appendix G of the FS (Parsons et al. 2004).

b – The range of mercury goals was specified in the ROD and the goals are considered performance criteria.

c – Lower end of the mercury range is based on reasonable maximum exposure (RME), non-carcinogenic risk. The higher end of the range is EPA's methylmercury National Recommended Water Quality criterion for the protection of human health for the consumption of organisms and is expressed as mg/kg in fish tissue.

d – Protection of river otter.

e – Lower end of PCB range represents the RME non-carcinogenic target for high molecular weight PCBs and is approximately equal to the target for $1x10^{-5}$ carcinogenic risk (0.03 mg/kg). Upper end of range is the RME target for 1×10^{-4} carcinogenic risk.

f – Although non-carcinogenic targets were not developed for dioxin/furans at the time of the ROD (2005), using the parameters presented in Appendix G of the FS (Parsons et al. 2005) for a target concentration for the non-cancer endpoint, and using the USEPA 2012 reference dose of 7E-10 mg/kg-day, the non-cancer target at a hazard quotient of 1 was determined by USEPA to be 1.3E-06 mg/kg (or 1.3 ng/kg) and is the lower end of the range. The upper end of the range is for protection of carcinogenic risk of $1x10^{-4}$, reasonable maximum exposure (RME).

g – Protection of belted kingfisher

h – Protection of osprey

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TABLE 3.2a 2020 ONONDAGA LAKE PREY FISH SUMMARY DATA

Parameter	Small Preyfish								Large Preyfish							
	Sample ID	Location ID	Species	Age	Gender	Average[2] Length (mm)	Weight (g)	Concentration	Sample ID	Location ID	Species	Age	Gender	Length (mm)	Weight (g)	Concentration
Mercury (mg/kg)	OL-3234-01	OL-F-1A	Round Goby	N/A	N/A	57	152	0.064	OL-3221-08	OL-F-1A	White Sucker	N/A	F	521	1761	ND
	OL-3234-02	OL-F-1A	Round Goby	N/A	N/A	73	115	0.074	OL-3221-06	OL-F-2A	White Sucker	N/A	M	510	1480	0.13
	OL-3234-03	OL-F-1A	Round Goby	N/A	N/A	65	125	0.068	OL-3231-01	OL-F-2A	Shorthead Redhorse	N/A	M	316	338	NRQ[1]
	OL-3234-04	OL-F-2A	Round Goby	N/A	N/A	72	177	0.063	OL-3231-02	OL-F-2A	Shorthead Redhorse	N/A	F	437	965	0.094
	OL-3234-05	OL-F-2A	Banded Killifish	N/A	N/A	54	103	0.08	OL-3231-03	OL-F-2A	Shorthead Redhorse	N/A	M	433	890	0.12
	OL-3234-06	OL-F-2A	Banded Killifish	N/A	N/A	52	114	0.078	OL-3221-01	OL-F-3A	White Sucker	N/A	M	512	1560	0.19
	OL-3234-07	OL-F-3A	Round Goby	N/A	N/A	63	120	0.063	OL-3227-01	OL-F-3A	White Sucker	N/A	F	530	1583	0.14
	OL-3234-08	OL-F-3A	Banded Killifish	N/A	N/A	64	118	0.11	OL-3231-07	OL-F-3A	Shorthead Redhorse	N/A	F	461	1149	0.22
	OL-3234-09	OL-F-3A	Round Goby	N/A	N/A	59	183	0.078	OL-3231-08	OL-F-3A	Shorthead Redhorse	N/A	F	432	926	ND
	OL-3234-10	OL-F-4A	Banded Killifish	N/A	N/A	47	106	0.1	OL-3221-07	OL-F-4A	White Sucker	N/A	F	521	1447	0.39
	OL-3234-11	OL-F-4A	Banded Killifish	N/A	N/A	52	104	0.11	OL-3231-04	OL-F-4A	Shorthead Redhorse	N/A	M	447	1027	0.22
	OL-3234-12	OL-F-4A	Banded Killifish	N/A	N/A	65	127	0.096	OL-3221-09	OL-F-5A	White Sucker	N/A	F	516	1250	0.22
	OL-3234-13	OL-F-5A	Round Goby	N/A	N/A	73	110	0.083	OL-3231-05	OL-F-5A	Shorthead Redhorse	N/A	F	492	1169	0.11
	OL-3234-14	OL-F-5A	Round Goby	N/A	N/A	71	114	0.059	OL-3231-06	OL-F-5A	Shorthead Redhorse	N/A	F	480	1127	0.17
	OL-3234-15	OL-F-5A	Banded Killifish	N/A	N/A	52	123	0.12	OL-3221-02	OL-F-5B	White Sucker	N/A	F	530	1700	0.13
	OL-3234-16	OL-F-5B	Banded Killifish	N/A	N/A	65	109	0.16	OL-3221-03	OL-F-5B	White Sucker	N/A	F	541	1854	0.16
	OL-3234-17	OL-F-5B	Banded Killifish	N/A	N/A	55	109	0.13	OL-3221-04	OL-F-6A	White Sucker	N/A	M	543	1791	0.18
	OL-3234-18	OL-F-5B	Banded Killifish	N/A	N/A	55	111	0.15	OL-3221-05	OL-F-6A	White Sucker	N/A	F	483	1553	0.16
	OL-3234-19	OL-F-6A	Round Goby	N/A	N/A	48	120	ND	OL-3232-01	OL-F-7A	White Sucker	N/A	M	450	973	NRQ[1]
	OL-3234-20	OL-F-6A	Banded Killifish	N/A	N/A	54	119	0.059	OL-3237-01	OL-F-3A	Shorthead Redhorse	N/A	M	455	1164	0.17
	OL-3235-01	OL-F-6A	Banded Killifish	N/A	N/A	76	115	0.057	OL-3237-02	OL-F-5B	Shorthead Redhorse	N/A	M	262	198	0.093
	OL-3235-02	OL-F-7A	Banded Killifish	N/A	N/A	79	107	0.096	OL-3237-03	OL-F-5B	White Sucker	N/A	M	331	399	ND
	OL-3235-03	OL-F-7A	Banded Killifish	N/A	N/A	76	105	0.15	OL-3237-04	OL-F-5B	White Sucker	N/A	M	312	375	0.073
	OL-3235-04	OL-F-7A	Round Goby	N/A	N/A	70	103	0.14	OL-3237-05	OL-F-6A	White Sucker	N/A	F	510	1573	0.25
Total PCBs[3] (mg/kg)	OL-3234-01	OL-F-1A	Round Goby	N/A	N/A	57	152	0.096	OL-3221-08	OL-F-1A	White Sucker	N/A	F	521	1761	0.18
	OL-3234-02	OL-F-1A	Round Goby	N/A	N/A	73	115	0.081	OL-3221-06	OL-F-2A	White Sucker	N/A	M	510	1480	0.22
	OL-3234-03	OL-F-1A	Round Goby	N/A	N/A	65	125	0.048	OL-3231-01	OL-F-2A	Shorthead Redhorse	N/A	M	316	338	NRQ[1]
	OL-3234-04	OL-F-2A	Round Goby	N/A	N/A	72	177	0.14	OL-3231-02	OL-F-2A	Shorthead Redhorse	N/A	F	437	965	0.45
	OL-3234-05	OL-F-2A	Banded Killifish	N/A	N/A	54	103	0.086	OL-3231-03	OL-F-2A	Shorthead Redhorse	N/A	M	433	890	0.49
	OL-3234-06	OL-F-2A	Banded Killifish	N/A	N/A	52	114	0.11	OL-3221-01	OL-F-3A	White Sucker	N/A	M	512	1560	0.11
	OL-3234-07	OL-F-3A	Round Goby	N/A	N/A	63	120	0.1	OL-3227-01	OL-F-3A	White Sucker	N/A	F	530	1583	0.14
	OL-3234-08	OL-F-3A	Banded Killifish	N/A	N/A	64	118	0.025	OL-3231-07	OL-F-3A	Shorthead Redhorse	N/A	F	461	1149	0.35
	OL-3234-09	OL-F-3A	Round Goby	N/A	N/A	59	183	0.063	OL-3231-08	OL-F-3A	Shorthead Redhorse	N/A	F	432	926	0.46
	OL-3234-10	OL-F-4A	Banded Killifish	N/A	N/A	47	106	0.02	OL-3221-07	OL-F-4A	White Sucker	N/A	F	521	1447	0.3
	OL-3234-11	OL-F-4A	Banded Killifish	N/A	N/A	52	104	ND	OL-3231-04	OL-F-4A	Shorthead Redhorse	N/A	M	447	1027	0.21
	OL-3234-12	OL-F-4A	Banded Killifish	N/A	N/A	65	127	0.044	OL-3221-09	OL-F-5A	White Sucker	N/A	F	516	1250	0.16
	OL-3234-13	OL-F-5A	Round Goby	N/A	N/A	73	110	0.069	OL-3231-05	OL-F-5A	Shorthead Redhorse	N/A	F	492	1169	0.45
	OL-3234-14	OL-F-5A	Round Goby	N/A	N/A	71	114	0.083	OL-3231-06	OL-F-5A	Shorthead Redhorse	N/A	F	480	1127	0.28
	OL-3234-15	OL-F-5A	Banded Killifish	N/A	N/A	52	123	0.019	OL-3221-02	OL-F-5B	White Sucker	N/A	F	530	1700	0.24
	OL-3234-16	OL-F-5B	Banded Killifish	N/A	N/A	65	109	0.044	OL-3221-03	OL-F-5B	White Sucker	N/A	F	541	1854	0.22
	OL-3234-17	OL-F-5B	Banded Killifish	N/A	N/A	55	109	0.045	OL-3221-04	OL-F-6A	White Sucker	N/A	M	543	1791	0.62
	OL-3234-18	OL-F-5B	Banded Killifish	N/A	N/A	55	111	0.046	OL-3221-05	OL-F-6A	White Sucker	N/A	F	483	1553	0.45
	OL-3234-19	OL-F-6A	Round Goby	N/A	N/A	48	120	0.45	OL-3232-01	OL-F-7A	White Sucker	N/A	M	450	973	NRQ[1]
	OL-3234-20	OL-F-6A	Banded Killifish	N/A	N/A	54	119	0.36	OL-3237-01	OL-F-3A	Shorthead Redhorse	N/A	M	455	1164	0.66
	OL-3235-01	OL-F-6A	Banded Killifish	N/A	N/A	76	115	0.52	OL-3237-02	OL-F-5B	Shorthead Redhorse	N/A	M	262	198	0.18
	OL-3235-02	OL-F-7A	Banded Killifish	N/A	N/A	79	107	0.018	OL-3237-03	OL-F-5B	White Sucker	N/A	M	331	399	0.06
	OL-3235-03	OL-F-7A	Banded Killifish	N/A	N/A	76	105	0.12	OL-3237-04	OL-F-5B	White Sucker	N/A	M	312	375	0.15
	OL-3235-04	OL-F-7A	Round Goby	N/A	N/A	70	103	0.2	OL-3237-05	OL-F-6A	White Sucker	N/A	F	510	1573	0.69

Notes:

1. NRQ = not reportable, poor quality due to homogenization issues
2. Small prey fish are processed as composite samples consisting of multiple individuals; length presented is average length of the composite sample
3. Total PCBs was calculated by the lab as sum of Aroclors, using detected values only, unless all non-detect, then maximum detection limit was reported
4. DDT and Metabolites was calculated as sum of DDT, DDE, and DDD; 1/2 the reporting limit was used for non-detects.

Acronyms:

mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
PCB = polychlorinated biphenyl
ND = non-detect

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TABLE 3.2a 2020 ONONDAGA LAKE PREY FISH SUMMARY DATA (CONTINUED)

Parameter	Small Preyfish								Large Preyfish							
	Sample ID	Location ID	Species	Age	Gender	Average[2] Length (mm)	Weight (grams)	Concentration	Sample ID	Location ID	Species	Age	Gender	Length (mm)	Weight (g)	Concentration
Sum of DDT and Metabolites[4] (mg/kg)	OL-3234-01	OL-F-1A	Round Goby	N/A	N/A	57	152	0.0018	OL-3221-08	OL-F-1A	White Sucker	N/A	F	521	1761	0.0188
	OL-3234-02	OL-F-1A	Round Goby	N/A	N/A	73	115	0.0021	OL-3221-06	OL-F-2A	White Sucker	N/A	M	510	1480	0.015
	OL-3234-03	OL-F-1A	Round Goby	N/A	N/A	65	125	0.0017	OL-3231-01	OL-F-2A	Shorthead Redhorse	N/A	M	316	338	NRQ[1]
	OL-3234-04	OL-F-2A	Round Goby	N/A	N/A	72	177	ND	OL-3231-02	OL-F-2A	Shorthead Redhorse	N/A	F	437	965	0.0247
	OL-3234-05	OL-F-2A	Banded Killifish	N/A	N/A	54	103	0.0016	OL-3231-03	OL-F-2A	Shorthead Redhorse	N/A	M	433	890	0.0369
	OL-3234-06	OL-F-2A	Banded Killifish	N/A	N/A	52	114	0.002	OL-3221-01	OL-F-3A	White Sucker	N/A	M	512	1560	0.0195
	OL-3234-07	OL-F-3A	Round Goby	N/A	N/A	63	120	ND	OL-3227-01	OL-F-3A	White Sucker	N/A	F	530	1583	0.0082
	OL-3234-08	OL-F-3A	Banded Killifish	N/A	N/A	64	118	0.0025	OL-3231-07	OL-F-3A	Shorthead Redhorse	N/A	F	461	1149	0.011
	OL-3234-09	OL-F-3A	Round Goby	N/A	N/A	59	183	ND	OL-3231-08	OL-F-3A	Shorthead Redhorse	N/A	F	432	926	0.0323
	OL-3234-10	OL-F-4A	Banded Killifish	N/A	N/A	47	106	0.0016	OL-3221-07	OL-F-4A	White Sucker	N/A	F	521	1447	0.0233
	OL-3234-11	OL-F-4A	Banded Killifish	N/A	N/A	52	104	0.00094	OL-3231-04	OL-F-4A	Shorthead Redhorse	N/A	M	447	1027	0.049
	OL-3234-12	OL-F-4A	Banded Killifish	N/A	N/A	65	127	ND	OL-3221-09	OL-F-5A	White Sucker	N/A	F	516	1250	0.0094
	OL-3234-13	OL-F-5A	Round Goby	N/A	N/A	73	110	0.0027	OL-3231-05	OL-F-5A	Shorthead Redhorse	N/A	F	492	1169	0.0841
	OL-3234-14	OL-F-5A	Round Goby	N/A	N/A	71	114	0.0024	OL-3231-06	OL-F-5A	Shorthead Redhorse	N/A	F	480	1127	0.019
	OL-3234-15	OL-F-5A	Banded Killifish	N/A	N/A	52	123	ND	OL-3221-02	OL-F-5B	White Sucker	N/A	F	530	1700	0.013
	OL-3234-16	OL-F-5B	Banded Killifish	N/A	N/A	65	109	0.00298	OL-3221-03	OL-F-5B	White Sucker	N/A	F	541	1854	0.011
	OL-3234-17	OL-F-5B	Banded Killifish	N/A	N/A	55	109	0.00305	OL-3221-04	OL-F-6A	White Sucker	N/A	M	543	1791	0.0237
	OL-3234-18	OL-F-5B	Banded Killifish	N/A	N/A	55	111	ND	OL-3221-05	OL-F-6A	White Sucker	N/A	F	483	1553	0.0324
	OL-3234-19	OL-F-6A	Round Goby	N/A	N/A	48	120	0.0011	OL-3232-01	OL-F-7A	White Sucker	N/A	M	450	973	NRQ[1]
	OL-3234-20	OL-F-6A	Banded Killifish	N/A	N/A	54	119	0.00249	OL-3237-01	OL-F-3A	Shorthead Redhorse	N/A	M	455	1164	0.06
	OL-3235-01	OL-F-6A	Banded Killifish	N/A	N/A	76	115	0.0095	OL-3237-02	OL-F-5B	Shorthead Redhorse	N/A	M	262	198	0.0079
	OL-3235-02	OL-F-7A	Banded Killifish	N/A	N/A	79	107	0.0078	OL-3237-03	OL-F-5B	White Sucker	N/A	M	331	399	ND
	OL-3235-03	OL-F-7A	Banded Killifish	N/A	N/A	76	105	0.0099	OL-3237-04	OL-F-5B	White Sucker	N/A	M	312	375	0.008
	OL-3235-04	OL-F-7A	Round Goby	N/A	N/A	70	103	0.0198	OL-3237-05	OL-F-6A	White Sucker	N/A	F	510	1573	0.028
Hexachlorobenzene (mg/kg)	OL-3234-01	OL-F-1A	Round Goby	N/A	N/A	57	152	ND	OL-3221-08	OL-F-1A	White Sucker	N/A	F	521	1761	ND
	OL-3234-02	OL-F-1A	Round Goby	N/A	N/A	73	115	ND	OL-3221-06	OL-F-2A	White Sucker	N/A	M	510	1480	ND
	OL-3234-03	OL-F-1A	Round Goby	N/A	N/A	65	125	ND	OL-3231-01	OL-F-2A	Shorthead Redhorse	N/A	M	316	338	NRQ[1]
	OL-3234-04	OL-F-2A	Round Goby	N/A	N/A	72	177	ND	OL-3231-02	OL-F-2A	Shorthead Redhorse	N/A	F	437	965	ND
	OL-3234-05	OL-F-2A	Banded Killifish	N/A	N/A	54	103	ND	OL-3231-03	OL-F-2A	Shorthead Redhorse	N/A	M	433	890	ND
	OL-3234-06	OL-F-2A	Banded Killifish	N/A	N/A	52	114	0.0011	OL-3221-01	OL-F-3A	White Sucker	N/A	M	512	1560	ND
	OL-3234-07	OL-F-3A	Round Goby	N/A	N/A	63	120	ND	OL-3227-01	OL-F-3A	White Sucker	N/A	F	530	1583	ND
	OL-3234-08	OL-F-3A	Banded Killifish	N/A	N/A	64	118	0.00048	OL-3231-07	OL-F-3A	Shorthead Redhorse	N/A	F	461	1149	0.059
	OL-3234-09	OL-F-3A	Round Goby	N/A	N/A	59	183	0.0013	OL-3231-08	OL-F-3A	Shorthead Redhorse	N/A	F	432	926	ND
	OL-3234-10	OL-F-4A	Banded Killifish	N/A	N/A	47	106	ND	OL-3221-07	OL-F-4A	White Sucker	N/A	F	521	1447	ND
	OL-3234-11	OL-F-4A	Banded Killifish	N/A	N/A	52	104	ND	OL-3231-04	OL-F-4A	Shorthead Redhorse	N/A	M	447	1027	0.011
	OL-3234-12	OL-F-4A	Banded Killifish	N/A	N/A	65	127	ND	OL-3221-09	OL-F-5A	White Sucker	N/A	F	516	1250	ND
	OL-3234-13	OL-F-5A	Round Goby	N/A	N/A	73	110	ND	OL-3231-05	OL-F-5A	Shorthead Redhorse	N/A	F	492	1169	ND
	OL-3234-14	OL-F-5A	Round Goby	N/A	N/A	71	114	0.00063	OL-3231-06	OL-F-5A	Shorthead Redhorse	N/A	F	480	1127	ND
	OL-3234-15	OL-F-5A	Banded Killifish	N/A	N/A	52	123	ND	OL-3221-02	OL-F-5B	White Sucker	N/A	F	530	1700	ND
	OL-3234-16	OL-F-5B	Banded Killifish	N/A	N/A	65	109	0.00046	OL-3221-03	OL-F-5B	White Sucker	N/A	F	541	1854	0.041
	OL-3234-17	OL-F-5B	Banded Killifish	N/A	N/A	55	109	0.00065	OL-3221-04	OL-F-6A	White Sucker	N/A	M	543	1791	ND
	OL-3234-18	OL-F-5B	Banded Killifish	N/A	N/A	55	111	0.00088	OL-3221-05	OL-F-6A	White Sucker	N/A	F	483	1553	ND
	OL-3234-19	OL-F-6A	Round Goby	N/A	N/A	48	120	ND	OL-3232-01	OL-F-7A	White Sucker	N/A	M	450	973	NRQ[1]
	OL-3234-20	OL-F-6A	Banded Killifish	N/A	N/A	54	119	ND	OL-3237-01	OL-F-3A	Shorthead Redhorse	N/A	M	455	1164	ND
	OL-3235-01	OL-F-6A	Banded Killifish	N/A	N/A	76	115	ND	OL-3237-02	OL-F-5B	Shorthead Redhorse	N/A	M	262	198	ND
	OL-3235-02	OL-F-7A	Banded Killifish	N/A	N/A	79	107	ND	OL-3237-03	OL-F-5B	White Sucker	N/A	M	331	399	ND
	OL-3235-03	OL-F-7A	Banded Killifish	N/A	N/A	76	105	ND	OL-3237-04	OL-F-5B	White Sucker	N/A	M	312	375	ND
	OL-3235-04	OL-F-7A	Round Goby	N/A	N/A	70	103	ND	OL-3237-05	OL-F-6A	White Sucker	N/A	F	510	1573	ND

Notes:

1. NRQ = not reportable, poor quality due to homogenization issues
2. Small prey fish are processed as composite samples consisting of multiple individuals; length presented is average length of the composite sample
3. Total PCBs was calculated by the lab as sum of Aroclors, using detected values only, unless all non-detect, then maximum detection limit was reported
4. DDT and Metabolites was calculated as sum of DDT, DDE, and DDD; 1/2 the reporting limit was used for non-detects.

Acronyms:

mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
PCB = polychlorinated biphenyl
ND = non-detect

Honeywell

PARSONS

TABLE 3.2a 2020 ONONDAGA LAKE PREY FISH SUMMARY DATA (CONTINUED)

Parameter	Small Preyfish								Large Preyfish							
	Sample ID	Location ID	Species	Age	Gender	Average[2] Length (mm)	Weight (grams)	Concentration	Sample ID	Location ID	Species	Age	Gender	Length (mm)	Weight (g)	Concentration
Percent Lipid (%)	OL-3234-01	OL-F-1A	Round Goby	N/A	N/A	57	152	2.70%	OL-3221-08	OL-F-1A	White Sucker	N/A	F	521	1761	7.10%
	OL-3234-02	OL-F-1A	Round Goby	N/A	N/A	73	115	2.50%	OL-3221-06	OL-F-2A	White Sucker	N/A	M	510	1480	7.70%
	OL-3234-03	OL-F-1A	Round Goby	N/A	N/A	65	125	2.40%	OL-3231-01	OL-F-2A	Shorthead Redhorse	N/A	M	316	338	NRQ[1]
	OL-3234-04	OL-F-2A	Round Goby	N/A	N/A	72	177	2.40%	OL-3231-02	OL-F-2A	Shorthead Redhorse	N/A	F	437	965	6.70%
	OL-3234-05	OL-F-2A	Banded Killifish	N/A	N/A	54	103	3.30%	OL-3231-03	OL-F-2A	Shorthead Redhorse	N/A	M	433	890	8.20%
	OL-3234-06	OL-F-2A	Banded Killifish	N/A	N/A	52	114	3.00%	OL-3221-01	OL-F-3A	White Sucker	N/A	M	512	1560	7.00%
	OL-3234-07	OL-F-3A	Round Goby	N/A	N/A	63	120	3.20%	OL-3227-01	OL-F-3A	White Sucker	N/A	F	530	1583	6.30%
	OL-3234-08	OL-F-3A	Banded Killifish	N/A	N/A	64	118	4.40%	OL-3231-07	OL-F-3A	Shorthead Redhorse	N/A	F	461	1149	8.60%
	OL-3234-09	OL-F-3A	Round Goby	N/A	N/A	59	183	3.20%	OL-3231-08	OL-F-3A	Shorthead Redhorse	N/A	F	432	926	9.60%
	OL-3234-10	OL-F-4A	Banded Killifish	N/A	N/A	47	106	2.20%	OL-3221-07	OL-F-4A	White Sucker	N/A	F	521	1447	7.40%
	OL-3234-11	OL-F-4A	Banded Killifish	N/A	N/A	52	104	3.30%	OL-3231-04	OL-F-4A	Shorthead Redhorse	N/A	M	447	1027	9.40%
	OL-3234-12	OL-F-4A	Banded Killifish	N/A	N/A	65	127	3.00%	OL-3221-09	OL-F-5A	White Sucker	N/A	F	516	1250	6.90%
	OL-3234-13	OL-F-5A	Round Goby	N/A	N/A	73	110	2.00%	OL-3231-05	OL-F-5A	Shorthead Redhorse	N/A	F	492	1169	6.40%
	OL-3234-14	OL-F-5A	Round Goby	N/A	N/A	71	114	2.30%	OL-3231-06	OL-F-5A	Shorthead Redhorse	N/A	F	480	1127	2.90%
	OL-3234-15	OL-F-5A	Banded Killifish	N/A	N/A	52	123	7.80%	OL-3221-02	OL-F-5B	White Sucker	N/A	F	530	1700	6.80%
	OL-3234-16	OL-F-5B	Banded Killifish	N/A	N/A	65	109	3.00%	OL-3221-03	OL-F-5B	White Sucker	N/A	F	541	1854	5.40%
	OL-3234-17	OL-F-5B	Banded Killifish	N/A	N/A	55	109	2.90%	OL-3221-04	OL-F-6A	White Sucker	N/A	M	543	1791	6.70%
	OL-3234-18	OL-F-5B	Banded Killifish	N/A	N/A	55	111	3.30%	OL-3221-05	OL-F-6A	White Sucker	N/A	F	483	1553	10.00%
	OL-3234-19	OL-F-6A	Round Goby	N/A	N/A	48	120	2.70%	OL-3232-01	OL-F-7A	White Sucker	N/A	M	450	973	NRQ[1]
	OL-3234-20	OL-F-6A	Banded Killifish	N/A	N/A	54	119	3.70%	OL-3237-01	OL-F-3A	Shorthead Redhorse	N/A	M	455	1164	9.10%
	OL-3235-01	OL-F-6A	Banded Killifish	N/A	N/A	76	115	2.90%	OL-3237-02	OL-F-5B	Shorthead Redhorse	N/A	M	262	198	5.90%
	OL-3235-02	OL-F-7A	Banded Killifish	N/A	N/A	79	107	2.20%	OL-3237-03	OL-F-5B	White Sucker	N/A	M	331	399	6.00%
	OL-3235-03	OL-F-7A	Banded Killifish	N/A	N/A	76	105	3.00%	OL-3237-04	OL-F-5B	White Sucker	N/A	M	312	375	5.80%
	OL-3235-04	OL-F-7A	Round Goby	N/A	N/A	70	103	2.10%	OL-3237-05	OL-F-6A	White Sucker	N/A	F	510	1573	6.50%

Notes:

1. NRQ = not reportable, poor quality due to homogenization issues
2. Small prey fish are processed as composite samples consisting of multiple individuals; length presented is average length of the composite sample
3. Total PCBs was calculated by the lab as sum of Aroclors, using detected values only, unless all non-detect, then maximum detection limit was reported
4. DDT and Metabolites was calculated as sum of DDT, DDE, and DDD; 1/2 the reporting limit was used for non-detects.

Acronyms:

mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
PCB = polychlorinated biphenyl
ND = non-detect

Honeywell

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TABLE 3.2b 2020 ONONDAGA LAKE SPORT FISH SUMMARY DATA

Parameter	Smallmouth Bass							Walleye						
	Sample ID	Location ID	Age	Gender	Length (mm)	Weight (g)	Concentration	Sample ID	Location ID	Age	Gender	Length (mm)	Weight (g)	Concentration
Mercury (mg/kg)	OL-3222-15F	OL-F-3A	4+	F	424	1268	0.37	OL-3220-11F	OL-F-1A	3+	F	485	1388	0.34
	OL-3223-05F	OL-F-4A	4+	M	385	1003	0.24	OL-3223-01F	OL-F-2A	18+	M	560	1934	NRQ[1]
	OL-3228-03F	OL-F-5B	10+	F	476	1289	NRQ[1]	OL-3222-02F	OL-F-4A	5+	F	511	1590	0.51
	OL-3228-04F	OL-F-5B	8+	M	470	1582	NRQ[1]	OL-3222-20F	OL-F-4A	5+	M	529	2024	NRQ[1]
	OL-3226-08F	OL-F-7A	5+	M	456	1432	0.47	OL-3220-08F	OL-F-5B	7	M	580	1916	NRQ[1]
	OL-3226-05F	OL-F-2A	8	F	432	1389	NRQ[1]	OL-3222-13F	OL-F-2A	5+	F	540	2040	NRQ[1]
	OL-3226-06F	OL-F-2A	7+	M	457	1166	NRQ[1]	OL-3222-18F	OL-F-3A	4+	F	482	1525	NRQ[1]
	OL-3220-13F	OL-F-5A	9+	F	480	1688	NRQ[1]	OL-3220-18F	OL-F-5A	4+	F	555	2332	NRQ[1]
	OL-3228-05F	OL-F-6A	8	F	464	1487	0.42	OL-3220-19F	OL-F-5A	8+	M	510	1706	NRQ[1]
	OL-3226-10F	OL-F-7A	5+	F	405	1094	NRQ[1]	OL-3222-09F	OL-F-5B	5	F	521	1793	NRQ[1]
	OL-3228-02F	OL-F-3A	8+	F	456	1515	0.95	OL-3220-14F	OL-F-7A	4+	F	515	1610	0.64
	OL-3222-01F	OL-F-5A	5	M	430	983	0.66	OL-3220-16F	OL-F-7A	6+	F	550	2210	0.82
	OL-3229-04F	OL-F-1A	8+	M	469	1318	0.53	OL-3222-12F	OL-F-2A	4+	F	530	1679	0.47
	OL-3223-08F	OL-F-5A	7	F	460	1426	0.41	OL-3223-07F	OL-F-4A	8+	M	490	1645	NRQ[1]
	OL-3228-01F	OL-F-3A	4+	F	415	1239	0.25	OL-3220-15F	OL-F-7A	5+	M	549	2194	NRQ[1]
	OL-3223-13F	OL-F-1A	5+	M	415	1053	NRQ[1]	OL-3220-10F	OL-F-1A	5+	F	521	1871	0.28
	OL-3223-14F	OL-F-1A	3+	F	395	1026	NRQ[1]	OL-3220-12F	OL-F-1A	3+	F	553	1751	NRQ[1]
	OL-3222-10F	OL-F-2A	4+	F	400	831	0.22	OL-3222-11F	OL-F-2A	7	M	505	1566	NRQ[1]
	OL-3226-02F	OL-F-3A	8+	F	456	1556	0.6	OL-3222-16F	OL-F-3A	5+	F	550	2277	NRQ[1]
	OL-3222-03F	OL-F-4A	10+	M	466	1364	NRQ[1]	OL-3222-17F	OL-F-3A	5+	F	535	2061	NRQ[1]
	OL-3223-06F	OL-F-4A	5+	F	415	1115	NRQ[1]	OL-3220-06F	OL-F-5A	3+	F	502	1481	NRQ[1]
	OL-3223-09F	OL-F-5A	8+	F	450	1014	NRQ[1]	OL-3220-20F	OL-F-5A	6+	F	548	2054	NRQ[1]
	OL-3222-07F	OL-F-5B	6+	F	486	1547	NRQ[1]	OL-3222-08F	OL-F-5B	6+	M	510	1623	NRQ[1]
	OL-3228-06F	OL-F-6A	6+	M	440	1169	0.32	OL-3220-09F	OL-F-6A	6+	F	546	2097	NRQ[1]
	OL-3226-09F	OL-F-7A	4+	F	415	1020	0.11	OL-3223-15F	OL-F-6A	4+	F	573	2435	NRQ[1]
Total PCBs (mg/kg)[2]	OL-3222-15F	OL-F-3A	4+	F	424	1268	0.16	OL-3220-11F	OL-F-1A	3+	F	485	1388	0.31
	OL-3223-05F	OL-F-4A	4+	M	385	1003	0.28	OL-3223-01F	OL-F-2A	18+	M	560	1934	NRQ[1]
	OL-3228-03F	OL-F-5B	10+	F	476	1289	NRQ[1]	OL-3222-02F	OL-F-4A	5+	F	511	1590	0.41
	OL-3228-04F	OL-F-5B	8+	M	470	1582	NRQ[1]	OL-3222-20F	OL-F-4A	5+	M	529	2024	NRQ[1]
	OL-3226-08F	OL-F-7A	5+	M	456	1432	0.58	OL-3220-08F	OL-F-5B	7	M	580	1916	NRQ[1]
	OL-3226-05F	OL-F-2A	8	F	432	1389	NRQ[1]	OL-3222-13F	OL-F-2A	5+	F	540	2040	NRQ[1]
	OL-3226-06F	OL-F-2A	7+	M	457	1166	NRQ[1]	OL-3222-18F	OL-F-3A	4+	F	482	1525	NRQ[1]
	OL-3220-13F	OL-F-5A	9+	F	480	1688	NRQ[1]	OL-3220-18F	OL-F-5A	4+	F	555	2332	NRQ[1]
	OL-3228-05F	OL-F-6A	8	F	464	1487	0.92	OL-3220-19F	OL-F-5A	8+	M	510	1706	NRQ[1]
	OL-3226-10F	OL-F-7A	5+	F	405	1094	NRQ[1]	OL-3222-09F	OL-F-5B	5	F	521	1793	NRQ[1]
	OL-3228-02F	OL-F-3A	8+	F	456	1515	0.98	OL-3220-14F	OL-F-7A	4+	F	515	1610	0.94
	OL-3222-01F	OL-F-5A	5	M	430	983	1.9	OL-3220-16F	OL-F-7A	6+	F	550	2210	0.91
	OL-3229-04F	OL-F-1A	8+	M	469	1318	0.72	OL-3222-12F	OL-F-2A	4+	F	530	1679	0.27
	OL-3223-08F	OL-F-5A	7	F	460	1426	0.35	OL-3223-07F	OL-F-4A	8+	M	490	1645	NRQ[1]
	OL-3228-01F	OL-F-3A	4+	F	415	1239	0.52	OL-3220-15F	OL-F-7A	5+	M	549	2194	NRQ[1]
	OL-3223-13F	OL-F-1A	5+	M	415	1053	NRQ[1]	OL-3220-10F	OL-F-1A	5+	F	521	1871	0.19
	OL-3223-14F	OL-F-1A	3+	F	395	1026	NRQ[1]	OL-3220-12F	OL-F-1A	3+	F	553	1751	NRQ[1]
	OL-3222-10F	OL-F-2A	4+	F	400	831	0.023	OL-3222-11F	OL-F-2A	7	M	505	1566	NRQ[1]
	OL-3226-02F	OL-F-3A	8+	F	456	1556	0.13	OL-3222-16F	OL-F-3A	5+	F	550	2277	NRQ[1]
	OL-3222-03F	OL-F-4A	10+	M	466	1364	NRQ[1]	OL-3222-17F	OL-F-3A	5+	F	535	2061	NRQ[1]
	OL-3223-06F	OL-F-4A	5+	F	415	1115	NRQ[1]	OL-3220-06F	OL-F-5A	3+	F	502	1481	NRQ[1]
	OL-3223-09F	OL-F-5A	8+	F	450	1014	NRQ[1]	OL-3220-20F	OL-F-5A	6+	F	548	2054	NRQ[1]
	OL-3222-07F	OL-F-5B	6+	F	486	1547	NRQ[1]	OL-3222-08F	OL-F-5B	6+	M	510	1623	NRQ[1]
	OL-3228-06F	OL-F-6A	6+	M	440	1169	0.81	OL-3220-09F	OL-F-6A	6+	F	546	2097	NRQ[1]
	OL-3226-09F	OL-F-7A	4+	F	415	1020	0.24	OL-3223-15F	OL-F-6A	4+	F	573	2435	NRQ[1]

Notes:

1. NRQ = not reportable, poor quality due ot homogenization issues
2. Total PCBs was calculated by the lab as sum of Aroclors, using detected values only, unless all non-detect, then maximum detection limit was reported
3. Dioxin/Furan Total TEQ was calculated as sum of congeners; 1/2 the method detection limit was used for non-detects

Acronyms:

mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
PCB = polychlorinated biphenyl
TEQ = toxicity equivalent quotient
ND = Non-detect

Honeywell

PARSONS

TABLE 3.2b 2020 ONONDAGA LAKE SPORT FISH SUMMARY DATA (CONTINUED)

Parameter	Smallmouth Bass							Walleye						
	Sample ID	Location ID	Age	Gender	Length (mm)	Weight (g)	Concentration	Sample ID	Location ID	Age	Gender	Length (mm)	Weight (g)	Concentration
Hexachlorobenzene (mg/kg)	OL-3222-15F	OL-F-3A	4+	F	424	1268	ND	OL-3220-11F	OL-F-1A	3+	F	485	1388	ND
	OL-3223-05F	OL-F-4A	4+	M	385	1003	ND	OL-3223-01F	OL-F-2A	18+	M	560	1934	NRQ[1]
	OL-3228-03F	OL-F-5B	10+	F	476	1289	NRQ[1]	OL-3222-02F	OL-F-4A	5+	F	511	1590	ND
	OL-3228-04F	OL-F-5B	8+	M	470	1582	NRQ[1]	OL-3222-20F	OL-F-4A	5+	M	529	2024	NRQ[1]
	OL-3226-08F	OL-F-7A	5+	M	456	1432	ND	OL-3220-08F	OL-F-5B	7	M	580	1916	NRQ[1]
	OL-3226-05F	OL-F-2A	8	F	432	1389	NRQ[1]	OL-3222-13F	OL-F-2A	5+	F	540	2040	NRQ[1]
	OL-3226-06F	OL-F-2A	7+	M	457	1166	NRQ[1]	OL-3222-18F	OL-F-3A	4+	F	482	1525	NRQ[1]
	OL-3220-13F	OL-F-5A	9+	F	480	1688	NRQ[1]	OL-3220-18F	OL-F-5A	4+	F	555	2332	NRQ[1]
	OL-3228-05F	OL-F-6A	8	F	464	1487	ND	OL-3220-19F	OL-F-5A	8+	M	510	1706	NRQ[1]
	OL-3226-10F	OL-F-7A	5+	F	405	1094	NRQ[1]	OL-3222-09F	OL-F-5B	5	F	521	1793	NRQ[1]
	OL-3228-02F	OL-F-3A	8+	F	456	1515	ND	OL-3220-14F	OL-F-7A	4+	F	515	1610	ND
	OL-3222-01F	OL-F-5A	5	M	430	983	ND	OL-3220-16F	OL-F-7A	6+	F	550	2210	ND
	OL-3229-04F	OL-F-1A	8+	M	469	1318	ND	OL-3222-12F	OL-F-2A	4+	F	530	1679	ND
	OL-3223-08F	OL-F-5A	7	F	460	1426	ND	OL-3223-07F	OL-F-4A	8+	M	490	1645	NRQ[1]
	OL-3228-01F	OL-F-3A	4+	F	415	1239	ND	OL-3220-15F	OL-F-7A	5+	M	549	2194	NRQ[1]
	OL-3223-13F	OL-F-1A	5+	M	415	1053	NRQ[1]	OL-3220-10F	OL-F-1A	5+	F	521	1871	ND
	OL-3223-14F	OL-F-1A	3+	F	395	1026	NRQ[1]	OL-3220-12F	OL-F-1A	3+	F	553	1751	NRQ[1]
	OL-3222-10F	OL-F-2A	4+	F	400	831	0.011	OL-3222-11F	OL-F-2A	7	M	505	1566	NRQ[1]
	OL-3226-02F	OL-F-3A	8+	F	456	1556	0.029	OL-3222-16F	OL-F-3A	5+	F	550	2277	NRQ[1]
	OL-3222-03F	OL-F-4A	10+	M	466	1364	NRQ[1]	OL-3222-17F	OL-F-3A	5+	F	535	2061	NRQ[1]
	OL-3223-06F	OL-F-4A	5+	F	415	1115	NRQ[1]	OL-3220-06F	OL-F-5A	3+	F	502	1481	NRQ[1]
	OL-3223-09F	OL-F-5A	8+	F	450	1014	NRQ[1]	OL-3220-20F	OL-F-5A	6+	F	548	2054	NRQ[1]
	OL-3222-07F	OL-F-5B	6+	F	486	1547	NRQ[1]	OL-3222-08F	OL-F-5B	6+	M	510	1623	NRQ[1]
	OL-3228-06F	OL-F-6A	6+	M	440	1169	0.0022	OL-3220-09F	OL-F-6A	6+	F	546	2097	NRQ[1]
	OL-3226-09F	OL-F-7A	4+	F	415	1020	ND	OL-3223-15F	OL-F-6A	4+	F	573	2435	NRQ[1]
Dioxin/Furan Total TEQ (ng/kg)[3]	OL-3222-15F	OL-F-3A	4+	F	424	1268	1.177	OL-3220-11F	OL-F-1A	3+	F	485	1388	1.003
	OL-3223-05F	OL-F-4A	4+	M	385	1003	1.208	OL-3223-01F	OL-F-2A	18+	M	560	1934	NRQ[1]
	OL-3228-03F	OL-F-5B	10+	F	476	1289	NRQ[1]	OL-3222-02F	OL-F-4A	5+	F	511	1590	0.456
	OL-3228-04F	OL-F-5B	8+	M	470	1582	NRQ[1]	OL-3222-20F	OL-F-4A	5+	M	529	2024	NRQ[1]
	OL-3226-08F	OL-F-7A	5+	M	456	1432	2.601	OL-3220-08F	OL-F-5B	7	M	580	1916	NRQ[1]
	OL-3226-05F	OL-F-2A	8	F	432	1389	NRQ[1]	OL-3222-13F	OL-F-2A	5+	F	540	2040	NRQ[1]
	OL-3226-06F	OL-F-2A	7+	M	457	1166	NRQ[1]	OL-3222-18F	OL-F-3A	4+	F	482	1525	NRQ[1]
	OL-3220-13F	OL-F-5A	9+	F	480	1688	NRQ[1]	OL-3220-18F	OL-F-5A	4+	F	555	2332	NRQ[1]
	OL-3228-05F	OL-F-6A	8	F	464	1487	3.218	OL-3220-19F	OL-F-5A	8+	M	510	1706	NRQ[1]
	OL-3226-10F	OL-F-7A	5+	F	405	1094	NRQ[1]	OL-3222-09F	OL-F-5B	5	F	521	1793	NRQ[1]
	OL-3228-02F	OL-F-3A	8+	F	456	1515	2.332	OL-3220-14F	OL-F-7A	4+	F	515	1610	0.706
	OL-3222-01F	OL-F-5A	5	M	430	983	1.463	OL-3220-16F	OL-F-7A	6+	F	550	2210	0.600
Percent Lipid (%)	OL-3222-15F	OL-F-3A	4+	F	424	1268	2.80%	OL-3220-11F	OL-F-1A	3+	F	485	1388	3.70%
	OL-3223-05F	OL-F-4A	4+	M	385	1003	3.10%	OL-3223-01F	OL-F-2A	18+	M	560	1934	NRQ[1]
	OL-3228-03F	OL-F-5B	10+	F	476	1289	NRQ[1]	OL-3222-02F	OL-F-4A	5+	F	511	1590	4.20%
	OL-3228-04F	OL-F-5B	8+	M	470	1582	NRQ[1]	OL-3222-20F	OL-F-4A	5+	M	529	2024	NRQ[1]
	OL-3226-08F	OL-F-7A	5+	M	456	1432	3.30%	OL-3220-08F	OL-F-5B	7	M	580	1916	NRQ[1]
	OL-3226-05F	OL-F-2A	8	F	432	1389	NRQ[1]	OL-3222-13F	OL-F-2A	5+	F	540	2040	NRQ[1]
	OL-3226-06F	OL-F-2A	7+	M	457	1166	NRQ[1]	OL-3222-18F	OL-F-3A	4+	F	482	1525	NRQ[1]
	OL-3220-13F	OL-F-5A	9+	F	480	1688	NRQ[1]	OL-3220-18F	OL-F-5A	4+	F	555	2332	NRQ[1]
	OL-3228-05F	OL-F-6A	8	F	464	1487	7.60%	OL-3220-19F	OL-F-5A	8+	M	510	1706	NRQ[1]
	OL-3226-10F	OL-F-7A	5+	F	405	1094	NRQ[1]	OL-3222-09F	OL-F-5B	5	F	521	1793	NRQ[1]
	OL-3228-02F	OL-F-3A	8+	F	456	1515	4.40%	OL-3220-14F	OL-F-7A	4+	F	515	1610	7.80%
	OL-3222-01F	OL-F-5A	5	M	430	983	3.50%	OL-3220-16F	OL-F-7A	6+	F	550	2210	5.00%
	OL-3229-04F	OL-F-1A	8+	M	469	1318	2.60%	OL-3222-12F	OL-F-2A	4+	F	530	1679	3.40%
	OL-3223-08F	OL-F-5A	7	F	460	1426	2.40%	OL-3223-07F	OL-F-4A	8+	M	490	1645	NRQ[1]
	OL-3228-01F	OL-F-3A	4+	F	415	1239	4.40%	OL-3220-15F	OL-F-7A	5+	M	549	2194	NRQ[1]
	OL-3223-13F	OL-F-1A	5+	M	415	1053	NRQ[1]	OL-3220-10F	OL-F-1A	5+	F	521	1871	4.30%
	OL-3223-14F	OL-F-1A	3+	F	395	1026	NRQ[1]	OL-3220-12F	OL-F-1A	3+	F	553	1751	NRQ[1]
	OL-3222-10F	OL-F-2A	4+	F	400	831	2.20%	OL-3222-11F	OL-F-2A	7	M	505	1566	NRQ[1]
	OL-3226-02F	OL-F-3A	8+	F	456	1556	2.60%	OL-3222-16F	OL-F-3A	5+	F	550	2277	NRQ[1]
	OL-3222-03F	OL-F-4A	10+	M	466	1364	NRQ[1]	OL-3222-17F	OL-F-3A	5+	F	535	2061	NRQ[1]
	OL-3223-06F	OL-F-4A	5+	F	415	1115	NRQ[1]	OL-3220-06F	OL-F-5A	3+	F	502	1481	NRQ[1]
	OL-3223-09F	OL-F-5A	8+	F	450	1014	NRQ[1]	OL-3220-20F	OL-F-5A	6+	F	548	2054	NRQ[1]
	OL-3222-07F	OL-F-5B	6+	F	486	1547	NRQ[1]	OL-3222-08F	OL-F-5B	6+	M	510	1623	NRQ[1]
	OL-3228-06F	OL-F-6A	6+	M	440	1169	3.00%	OL-3220-09F	OL-F-6A	6+	F	546	2097	NRQ[1]
	OL-3226-09F	OL-F-7A	4+	F	415	1020	5.30%	OL-3223-15F	OL-F-6A	4+	F	573	2435	NRQ[1]

Notes:

1. NRQ = not reportable, poor quality due ot homogenization issues
2. Total PCBs was calculated by the lab as sum of Aroclors, using detected values only, unless all non-detect, then maximum detection limit was reported
3. Dioxin/Furan Total TEQ was calculated as sum of congeners; 1/2 the method detection limit was used for non-detects

Acronyms:

mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
PCB = polychlorinated biphenyl
TEQ = toxicity equivalent quotient
ND = Non-detect

Honeywell

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TABLE 3.2b 2020 ONONDAGA LAKE SPORT FISH SUMMARY DATA (CONTINUED)

Parameter	Pumpkinseed							Common Carp						
	Sample ID	Location ID	Age	Gender	Length (mm)	Weight (g)	Concentration	Sample ID	Location ID	Age	Gender	Length (mm)	Weight (g)	Concentration
Mercury (mg/kg)	OL-3224-02F	OL-F-5A	3+	M	186	163	0.31	OL-3229-05F	OL-F-1A	5+	F	648	4526	NRQ[1]
	OL-3238-02F	OL-F-5A	3+	F	181	141	0.088	OL-3226-03F	OL-F-2A	2+	F	468	1378	NRQ[1]
	OL-3220-17F	OL-F-5B	4+	M	190	155	0.2	OL-3220-05F	OL-F-5A	5+	F	669	5037	NRQ[1]
	OL-3230-05F	OL-F-5B	3+	M	195	159	0.21	OL-3229-01F	OL-F-5A	4+	M	416	1068	NRQ[1]
	OL-3220-07F	OL-F-6A	4+	F	183	141	0.18	OL-3225-02F	OL-F-6A	4+	F	682	4669	NRQ[1]
	OL-3233-01F	OL-F-3A	3+	M	156	87	ND	OL-3223-04F	OL-F-4A	3+	M	630	3978	NRQ[1]
	OL-3224-01F	OL-F-5A	2+	M	160	89	0.19	OL-3236-01F	OL-F-5A	4+	M	702	4598	NRQ[1]
	OL-3224-04F	OL-F-5A	4+	F	176	120	ND	OL-3222-05F	OL-F-5B	3+	M	445	1411	NRQ[1]
	OL-3238-01F	OL-F-5A	4	M	162	118	ND	OL-3222-06F	OL-F-5B	3+	M	445	1329	ND
	OL-3223-10F	OL-F-7A	2+	M	167	114	0.15	OL-3225-04F	OL-F-6A	2+	F	600	3704	NRQ[1]
	OL-3238-04F	OL-F-2A	3	M	158	84	0.066	OL-3223-12F	OL-F-1A	7+	F	618	3154	0.25
	OL-3238-05F	OL-F-3A	3+	F	155	82	0.065	OL-3226-07F	OL-F-3A	4+	F	635	3419	0.13
	OL-3236-02F	OL-F-2A	3+	F	146	73	NRQ[1]	OL-3229-06F	OL-F-2A	2+	F	446	1343	ND
	OL-3238-03F	OL-F-2A	2+	F	152	77	NRQ[1]	OL-3222-19F	OL-F-4A	3+	F	518	1956	ND
	OL-3230-01F	OL-F-4A	2+	F	143	80	NRQ[1]	OL-3230-04F	OL-F-7A	6	F	640	3815	NRQ[1]
	OL-3220-01F	OL-F-1A	2+	M	132	46	NRQ[1]	OL-3225-01F	OL-F-1A	6+	F	655	4006	ND
	OL-3220-02F	OL-F-1A	3+	M	129	42	NRQ[1]	OL-3226-04F	OL-F-2A	5	F	646	3691	0.071
	OL-3220-03F	OL-F-1A	2+	F	129	41	0.068	OL-3222-14F	OL-F-3A	3+	M	565	2432	NRQ[1]
	OL-3236-04F	OL-F-3A	2+	F	129	36	0.05	OL-3226-01F	OL-F-3A	6	F	670	4290	NRQ[1]
	OL-3230-02F	OL-F-4A	3+	M	135	55	NRQ[1]	OL-3223-03F	OL-F-4A	4	F	556	3121	NRQ[1]
	OL-3230-03F	OL-F-4A	4+	M	132	58	0.061	OL-3220-04F	OL-F-5A	4+	F	562	5264	NRQ[1]
	OL-3224-03F	OL-F-5A	2+	F	142	69	0.14	OL-3222-04F	OL-F-5B	4+	M	492	1767	NRQ[1]
	OL-3223-11F	OL-F-5B	2+	M	145	70	0.084	OL-3223-02F	OL-F-5B	3+	M	400	1015	NRQ[1]
	OL-3229-02F	OL-F-7A	2+	F	127	46	0.057	OL-3225-03F	OL-F-6A	4+	F	602	3179	NRQ[1]
	OL-3229-03F	OL-F-7A	3+	M	138	56	0.05	OL-3236-03F	OL-F-7A	2+	F	400	980	ND
Total PCBs (mg/kg)[2]	OL-3224-02F	OL-F-5A	3+	M	186	163	0.081	OL-3229-05F	OL-F-1A	5+	F	648	4526	NRQ[1]
	OL-3238-02F	OL-F-5A	3+	F	181	141	0.091	OL-3226-03F	OL-F-2A	2+	F	468	1378	NRQ[1]
	OL-3220-17F	OL-F-5B	4+	M	190	155	0.11	OL-3220-05F	OL-F-5A	5+	F	669	5037	NRQ[1]
	OL-3230-05F	OL-F-5B	3+	M	195	159	0.057	OL-3229-01F	OL-F-5A	4+	M	416	1068	NRQ[1]
	OL-3220-07F	OL-F-6A	4+	F	183	141	0.12	OL-3225-02F	OL-F-6A	4+	F	682	4669	NRQ[1]
	OL-3233-01F	OL-F-3A	3+	M	156	87	0.044	OL-3223-04F	OL-F-4A	3+	M	630	3978	NRQ[1]
	OL-3224-01F	OL-F-5A	2+	M	160	89	0.025	OL-3236-01F	OL-F-5A	4+	M	702	4598	NRQ[1]
	OL-3224-04F	OL-F-5A	4+	F	176	120	0.028	OL-3222-05F	OL-F-5B	3+	M	445	1411	NRQ[1]
	OL-3238-01F	OL-F-5A	4	M	162	118	0.0085	OL-3222-06F	OL-F-5B	3+	M	445	1329	0.15
	OL-3223-10F	OL-F-7A	2+	M	167	114	0.13	OL-3225-04F	OL-F-6A	2+	F	600	3704	NRQ[1]
	OL-3238-04F	OL-F-2A	3	M	158	84	0.13	OL-3223-12F	OL-F-1A	7+	F	618	3154	0.13
	OL-3238-05F	OL-F-3A	3+	F	155	82	0.075	OL-3226-07F	OL-F-3A	4+	F	635	3419	0.45
	OL-3236-02F	OL-F-2A	3+	F	146	73	NRQ[1]	OL-3229-06F	OL-F-2A	2+	F	446	1343	0.24
	OL-3238-03F	OL-F-2A	2+	F	152	77	NRQ[1]	OL-3222-19F	OL-F-4A	3+	F	518	1956	0.22
	OL-3230-01F	OL-F-4A	2+	F	143	80	NRQ[1]	OL-3230-04F	OL-F-7A	6	F	640	3815	NRQ[1]
	OL-3220-01F	OL-F-1A	2+	M	132	46	NRQ[1]	OL-3225-01F	OL-F-1A	6+	F	655	4006	0.49
	OL-3220-02F	OL-F-1A	3+	M	129	42	NRQ[1]	OL-3226-04F	OL-F-2A	5	F	646	3691	0.17
	OL-3220-03F	OL-F-1A	2+	F	129	41	0.04	OL-3222-14F	OL-F-3A	3+	M	565	2432	NRQ[1]
	OL-3236-04F	OL-F-3A	2+	F	129	36	0.019	OL-3226-01F	OL-F-3A	6	F	670	4290	NRQ[1]
	OL-3230-02F	OL-F-4A	3+	M	135	55	NRQ[1]	OL-3223-03F	OL-F-4A	4	F	556	3121	NRQ[1]
	OL-3230-03F	OL-F-4A	4+	M	132	58	0.03	OL-3220-04F	OL-F-5A	4+	F	562	5264	NRQ[1]
	OL-3224-03F	OL-F-5A	2+	F	142	69	0.028	OL-3222-04F	OL-F-5B	4+	M	492	1767	NRQ[1]
	OL-3223-11F	OL-F-5B	2+	M	145	70	0.039	OL-3223-02F	OL-F-5B	3+	M	400	1015	NRQ[1]
	OL-3229-02F	OL-F-7A	2+	F	127	46	0.023	OL-3225-03F	OL-F-6A	4+	F	602	3179	NRQ[1]
	OL-3229-03F	OL-F-7A	3+	M	138	56	0.036	OL-3236-03F	OL-F-7A	2+	F	400	980	0.011

Notes:

1. NRQ = not reportable, poor quality due ot homogenization issues
2. Total PCBs was calculated by the lab as sum of Aroclors, using detected values only, unless all non-detect, then maximum detection limit was reported
3. Dioxin/Furan Total TEQ was calculated as sum of congeners; 1/2 the method detection limit was used for non-detects

Acronyms:

mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
PCB = polychlorinated biphenyl
TEQ = toxicity equivalent quotient
ND = Non-detect

Honeywell

PARSONS

TABLE 3.2b 2020 ONONDAGA LAKE SPORT FISH SUMMARY DATA (CONTINUED)

Parameter	Pumpkinseed							Common Carp						
	Sample ID	Location ID	Age	Gender	Length (mm)	Weight (g)	Concentration	Sample ID	Location ID	Age	Gender	Length (mm)	Weight (g)	Concentration
Hexachlorobenzene (mg/kg)	0L-3224-02F	0L-F-5A	3+	M	186	163	ND	0L-3229-05F	0L-F-1A	5+	F	648	4526	NRQ[1]
	0L-3238-02F	0L-F-5A	3+	F	181	141	ND	0L-3226-03F	0L-F-2A	2+	F	468	1378	NRQ[1]
	0L-3220-17F	0L-F-5B	4+	M	190	155	ND	0L-3220-05F	0L-F-5A	5+	F	669	5037	NRQ[1]
	0L-3230-05F	0L-F-5B	3+	M	195	159	ND	0L-3229-01F	0L-F-5A	4+	M	416	1068	NRQ[1]
	0L-3220-07F	0L-F-6A	4+	F	183	141	ND	0L-3225-02F	0L-F-6A	4+	F	682	4669	NRQ[1]
	0L-3233-01F	0L-F-3A	3+	M	156	87	Not analyzed	0L-3223-04F	0L-F-4A	3+	M	630	3978	NRQ[1]
	0L-3224-01F	0L-F-5A	2+	M	160	89	Not analyzed	0L-3236-01F	0L-F-5A	4+	M	702	4598	NRQ[1]
	0L-3224-04F	0L-F-5A	4+	F	176	120	ND	0L-3222-05F	0L-F-5B	3+	M	445	1411	NRQ[1]
	0L-3238-01F	0L-F-5A	4	M	162	118	ND	0L-3222-06F	0L-F-5B	3+	M	445	1329	0.0014
	0L-3223-10F	0L-F-7A	2+	M	167	114	0.0022	0L-3225-04F	0L-F-6A	2+	F	600	3704	NRQ[1]
	0L-3238-04F	0L-F-2A	3	M	158	84	Not analyzed	0L-3223-12F	0L-F-1A	7+	F	618	3154	ND
	0L-3238-05F	0L-F-3A	3+	F	155	82	Not analyzed	0L-3226-07F	0L-F-3A	4+	F	635	3419	ND
	0L-3236-02F	0L-F-2A	3+	F	146	73	NRQ[1]	0L-3229-06F	0L-F-2A	2+	F	446	1343	0.0024
	0L-3238-03F	0L-F-2A	2+	F	152	77	NRQ[1]	0L-3222-19F	0L-F-4A	3+	F	518	1956	ND
	0L-3230-01F	0L-F-4A	2+	F	143	80	NRQ[1]	0L-3230-04F	0L-F-7A	6	F	640	3815	NRQ[1]
	0L-3220-01F	0L-F-1A	2+	M	132	46	Not analyzed	0L-3225-01F	0L-F-1A	6+	F	655	4006	0.012
	0L-3220-02F	0L-F-1A	3+	M	129	42	Not analyzed	0L-3226-04F	0L-F-2A	5	F	646	3691	ND
	0L-3220-03F	0L-F-1A	2+	F	129	41	Not analyzed	0L-3222-14F	0L-F-3A	3+	M	565	2432	NRQ[1]
	0L-3236-04F	0L-F-3A	2+	F	129	36	Not analyzed	0L-3226-01F	0L-F-3A	6	F	670	4290	NRQ[1]
	0L-3230-02F	0L-F-4A	3+	M	135	55	Not analyzed	0L-3223-03F	0L-F-4A	4	F	556	3121	NRQ[1]
	0L-3230-03F	0L-F-4A	4+	M	132	58	Not analyzed	0L-3220-04F	0L-F-5A	4+	F	562	5264	NRQ[1]
	0L-3224-03F	0L-F-5A	2+	F	142	69	Not analyzed	0L-3222-04F	0L-F-5B	4+	M	492	1767	NRQ[1]
	0L-3223-11F	0L-F-5B	2+	M	145	70	Not analyzed	0L-3223-02F	0L-F-5B	3+	M	400	1015	NRQ[1]
	0L-3229-02F	0L-F-7A	2+	F	127	46	Not analyzed	0L-3225-03F	0L-F-6A	4+	F	602	3179	NRQ[1]
	0L-3229-03F	0L-F-7A	3+	M	138	56	Not analyzed	0L-3236-03F	0L-F-7A	2+	F	400	980	ND
Dioxin/Furan Total TEQ (ng/kg)[3]	0L-3224-02F	0L-F-5A	3+	M	186	163	0.134	0L-3229-05F	0L-F-1A	5+	F	648	4526	NRQ[1]
	0L-3238-02F	0L-F-5A	3+	F	181	141	0.106	0L-3226-03F	0L-F-2A	2+	F	468	1378	NRQ[1]
	0L-3220-17F	0L-F-5B	4+	M	190	155	1.086	0L-3220-05F	0L-F-5A	5+	F	669	5037	NRQ[1]
	0L-3230-05F	0L-F-5B	3+	M	195	159	0.417	0L-3229-01F	0L-F-5A	4+	M	416	1068	NRQ[1]
	0L-3220-07F	0L-F-6A	4+	F	183	141	1.188	0L-3225-02F	0L-F-6A	4+	F	682	4669	NRQ[1]
	0L-3233-01F	0L-F-3A	3+	M	156	87	0.160	0L-3223-04F	0L-F-4A	3+	M	630	3978	NRQ[1]
	0L-3224-01F	0L-F-5A	2+	M	160	89	0.354	0L-3236-01F	0L-F-5A	4+	M	702	4598	NRQ[1]
	0L-3224-04F	0L-F-5A	4+	F	176	120	0.331	0L-3222-05F	0L-F-5B	3+	M	445	1411	NRQ[1]
	0L-3238-01F	0L-F-5A	4	M	162	118	0.320	0L-3222-06F	0L-F-5B	3+	M	445	1329	0.432
	0L-3223-10F	0L-F-7A	2+	M	167	114	0.214	0L-3225-04F	0L-F-6A	2+	F	600	3704	NRQ[1]
	0L-3238-04F	0L-F-2A	3	M	158	84	0.108	0L-3223-12F	0L-F-1A	7+	F	618	3154	1.052
	0L-3238-05F	0L-F-3A	3+	F	155	82	0.115	0L-3226-07F	0L-F-3A	4+	F	635	3419	2.658
Percent Lipid (%)	0L-3224-02F	0L-F-5A	3+	M	186	163	2.00%	0L-3229-05F	0L-F-1A	5+	F	648	4526	NRQ[1]
	0L-3238-02F	0L-F-5A	3+	F	181	141	2%	0L-3226-03F	0L-F-2A	2+	F	468	1378	NRQ[1]
	0L-3220-17F	0L-F-5B	4+	M	190	155	1.50%	0L-3220-05F	0L-F-5A	5+	F	669	5037	NRQ[1]
	0L-3230-05F	0L-F-5B	3+	M	195	159	0.84%	0L-3229-01F	0L-F-5A	4+	M	416	1068	NRQ[1]
	0L-3220-07F	0L-F-6A	4+	F	183	141	1.40%	0L-3225-02F	0L-F-6A	4+	F	682	4669	NRQ[1]
	0L-3233-01F	0L-F-3A	3+	M	156	87	5.70%	0L-3223-04F	0L-F-4A	3+	M	630	3978	NRQ[1]
	0L-3224-01F	0L-F-5A	2+	M	160	89	2.40%	0L-3236-01F	0L-F-5A	4+	M	702	4598	NRQ[1]
	0L-3224-04F	0L-F-5A	4+	F	176	120	1.70%	0L-3222-05F	0L-F-5B	3+	M	445	1411	NRQ[1]
	0L-3238-01F	0L-F-5A	4	M	162	118	1.80%	0L-3222-06F	0L-F-5B	3+	M	445	1329	1.60%
	0L-3223-10F	0L-F-7A	2+	M	167	114	1.70%	0L-3225-04F	0L-F-6A	2+	F	600	3704	NRQ[1]
	0L-3238-04F	0L-F-2A	3	M	158	84	5.70%	0L-3223-12F	0L-F-1A	7+	F	618	3154	1.80%
	0L-3238-05F	0L-F-3A	3+	F	155	82	2.40%	0L-3226-07F	0L-F-3A	4+	F	635	3419	10%
	0L-3236-02F	0L-F-2A	3+	F	146	73	NRQ[1]	0L-3229-06F	0L-F-2A	2+	F	446	1343	9.50%
	0L-3238-03F	0L-F-2A	2+	F	152	77	NRQ[1]	0L-3222-19F	0L-F-4A	3+	F	518	1956	7.20%
	0L-3230-01F	0L-F-4A	2+	F	143	80	NRQ[1]	0L-3230-04F	0L-F-7A	6	F	640	3815	NRQ[1]
	0L-3220-01F	0L-F-1A	2+	M	132	46	Not analyzed	0L-3225-01F	0L-F-1A	6+	F	655	4006	0.50%
	0L-3220-02F	0L-F-1A	3+	M	129	42	Not analyzed	0L-3226-04F	0L-F-2A	5	F	646	3691	8.90%
	0L-3220-03F	0L-F-1A	2+	F	129	41	Not analyzed	0L-3222-14F	0L-F-3A	3+	M	565	2432	NRQ[1]
	0L-3236-04F	0L-F-3A	2+	F	129	36	Not analyzed	0L-3226-01F	0L-F-3A	6	F	670	4290	NRQ[1]
	0L-3230-02F	0L-F-4A	3+	M	135	55	NRQ[1]	0L-3223-03F	0L-F-4A	4	F	556	3121	NRQ[1]
	0L-3230-03F	0L-F-4A	4+	M	132	58	1.60%	0L-3220-04F	0L-F-5A	4+	F	562	5264	NRQ[1]
	0L-3224-03F	0L-F-5A	2+	F	142	69	1.70%	0L-3222-04F	0L-F-5B	4+	M	492	1767	NRQ[1]
	0L-3223-11F	0L-F-5B	2+	M	145	70	1.60%	0L-3223-02F	0L-F-5B	3+	M	400	1015	NRQ[1]
	0L-3229-02F	0L-F-7A	2+	F	127	46	Not analyzed	0L-3225-03F	0L-F-6A	4+	F	602	3179	NRQ[1]
	0L-3229-03F	0L-F-7A	3+	M	138	56	2.70%	0L-3236-03F	0L-F-7A	2+	F	400	980	2.00%

Notes:

1. NRQ = not reportable, poor quality due ot homogenization issues
2. Total PCBs was calculated by the lab as sum of Aroclors, using detected values only, unless all non-detect, then maximum detection limit was reported
3. Dioxin/Furan Total TEQ was calculated as sum of congeners; 1/2 the method detection limit was used for non-detects

Acronyms:

mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
PCB = polychlorinated biphenyl
TEQ = toxicity equivalent quotient
ND = Non-detect

TABLE 3.3 MERCURY CONCENTRATIONS (MG/KG WET WEIGHT) IN ONONDAGA LAKE ZOOPLANKTON COLLECTED AT SOUTH DEEP IN 2020

2020 Sampling Date	Total Mercury (mg/kg wet weight)	Validation Qualifier	Methyl Mercury (mg/kg wet weight)	Validation Qualifier	Methylmercury (as Percent of Total Mercury)
May 12			0.0005	U	
June 16	0.000174	U	0.0008	U	[1]
July 06	0.0148		0.001	U	6.8
July 21	0.189		0.0005	U	0.26
August 04	0.00615	J	0.0005	UJ	8.1
August 18	0.0229		0.007		30.6
September 01	0.0676		0.0005	U	0.74
September 09	0.0414		0.00001		0.02
September 15	0.0146		0.001	U	6.9
September 22			0.0009	J	
September 29			0.0022	U	
October 06			0.0062		
October 13			0.0033	UJ	
October 20			0.315	UJ	
October 27			0.0012	U	
November 04			0.003	J	
November 18			0.001	U	

Notes:
[1] Methylmercury as a percentage of total mercury not calculated as both total and methylmercury were not detected.
U: not detected at reporting limit specified;
J: estimated concentration
J+: estimated concentration biased high;
J-: estimated concentration biased low

TABLE 4.1 2020 SEDIMENT TRAP SLURRY MERCURY AND SOLIDS CONTENT RESULTS

Site	Trap Deploy Date	Trap Recover Date	Deployment Duration (Days)	Sample Volume (mL)	Slurry Mercury Results (µg/L)	TSS (mg/L)	TSS FD (mg/L)	TSS FD2 (mg/L)	TSS Average (mg/L)	TSS Deposition (mg per m² per day)	Mercury Concentration (mg/kg)	Mercury Deposition (µg per m² per day)
SD	5/5/2020	5/12/2020	7	117	0.66	7,500	8,092	6,164	7,252	26,720	0.09	2.43
SD	5/12/2020	5/20/2020	8	133		2,512	2,448	3,076	2,679	9,817	-	-
SD	5/20/2020	5/26/2020	6	118	0.5	2,224	1,916	1,604	1,915	8,301	0.26	2.17
SD	5/26/2020	6/1/2020	6	134		2,592	2,360	2,156	2,369	11,664	-	-
SD	6/1/2020	6/8/2020	7	126	0.26	3,132	3,204	3,232	3,189	12,655	0.08	1.03
SD	6/8/2020	6/16/2020	8	131		2,908	3,152	2,368	2,809	10,141	-	-
SD	6/16/2020	6/22/2020	6	125	0.5	2,324	1,652	1,708	1,895	8,701	0.26	2.30
SD	6/22/2020	6/30/2020	8	109		1,008	1,260	2,168	1,479	4,441	-	-
SD	6/30/2020	7/6/2020	6	128	0.5	1,468	1,396	1,760	1,541	7,248	0.32	2.35
SD	7/6/2020	7/14/2020	8	111		4,908	3,928	4,580	4,472	13,678	-	-
SD	7/14/2020	7/21/2020	7	129	0.5	1,848	1,544	1,700	1,697	6,895	0.29	2.03
SD	7/21/2020	7/28/2020	7	118		2,788	4,036	2,852	3,225	11,985	-	-
SD	7/28/2020	8/4/2020	7	112	0.26	3,620	2,576	2,892	3,029	10,684	0.09	0.92
SD	8/4/2020	8/11/2020	7	113		2,368	1,644	2,168	2,060	7,330	-	-
SD	8/11/2020	8/18/2020	7	112	0.5	1,904	2,320	2,608	2,277	8,032	0.22	1.76
SD	8/18/2020	8/26/2020	8	133	0.38	1,944	1,588	1,808	1,780	6,523	0.21	1.39
SD	8/26/2020	9/1/2020	6	125	0.49	1,720	1,900	1,832	1,817	8,346	0.27	2.25
SD	9/1/2020	9/9/2020	8	117	0.59	1,704	1,768	2,028	1,833	5,910	0.32	1.90
SD	9/9/2020	9/15/2020	6	126	0.32	2,208	1,648	1,812	1,889	8,746	0.17	1.48
SD	9/15/2020	9/22/2020	7	118	0.52	1,484	1,392	1,300	1,392	5,173	0.37	1.93
SD	9/22/2020	9/29/2020	7	122	0.5	1,012	960	904	959	3,683	0.52	1.92
SD	9/29/2020	10/6/2020	7	114	0.58	1,524	1,192	1,180	1,299	4,662	0.45	2.08
SD	10/6/2020	10/13/2020	7	100	0.8	4,472	2,900	3,176	3,516	11,072	0.23	2.52
SD	10/13/2020	10/20/2020	7	95	0.61	2,056	1,940	1,744	1,913	5,724	0.32	1.82
SD	10/20/2020	10/27/2020	7	87	0.78	2,648	2,608	2,988	2,748	7,529	0.28	2.14
SD	10/27/2020	11/4/2020	8	80	1.39	15,608	19,860	13,728	16,399	36,149	0.08	3.06
SD	11/4/2020	11/18/2020	14	107	5.6	8,264	6,424	7,792	7,493	12,624	0.75	9.43
South Deep Arithmetic Mean			-	-	-	-	-	-	-	10,164	0.28	2.35

Legend: SD - South Deep, TSS - total suspended solids.

Notes: (1) Mercury concentration = slurry mercury average divided by TSS average times a units conversion of 1,000. Concentrations are based on dry weight. Calculations of TSS and mercury deposition include the surface area of the sediment traps (45.3646 square centimeters).

(2) Solids and mercury deposition from June through September averaged 8,245 mg per square meter per day and 1.77 micrograms per square meter per day, respectively. June through September is when the sediment traps are below the thermocline and not subject to mixing within upper waters.

TABLE 5.1 2020 NITRATE ADDITION SUMMARY

Date/Location[1]	Metric Tons (as N) of CN-8 Applied[2]	Application Water Depth[3] (feet)	Dilution Water to CN-8 Volume Ratio[4]
July 7 / S1	1.84	63.75	242
July 9 / S2	1.88	64	284
July 13 / S1	1.84	61.8	276
July 15 / N	1.88	60.4	295
July 16 / S2	1.86	64	286
July 20 / S1	1.86	65	286
July 21 / N	1.86	60.6	148
July 22 / S2	1.86	64	316
July 27 / S1	1.91	66.3	270
July 29 / N	1.84	64.1	291
July 30 / S2	1.86	66.2	263
August 3 / S1	2.12	64.6	272
August 5 / N	2.09	59.4	284
August 10 / S1	2.05	64.9	293
August 12 / N	2.11	59.1	296
August 13 / S2	2.11	65.6	282
August 17 / S1	2.09	65.5	284
August 19 / N	2.09	60.7	300
August 20 / S2	2.09	65.4	291
August 24 / S1	2.03	64	303
August 25 / N	2.11	60	282
August 31 / S1	2.11	63.1	294
September 2 / N	2.11	60	377
September 3 / S2	2.11	65	393
September 8 / S1	2.11	66	402
September 10 / N	2.11	60	422
September 14 / S1	2.11	65	375
September 16 / N	2.11	60	518
September 17 / S2	2.11	64	472
September 21 / S1	1.93	64	501
September 23 / N	2.11	65	598
September 24 / S2	2.11	64	558
September 28 / S1	1.78	65	625
September 30 / N	2.11	60	635
October 5 / S2	1.74	64	532
October 8 / N	2.11	60	704
October 9 / S1	1.38	64	682
October 12 / S1	1.08	65	865
October 13 / S1	1.61	66	854
October 14 / S1	1.44	65	228

[1] S1 is the South Location 1, S2 is the South Location 2, and N is the North Location (Figure 5.1)
[2] 1 metric ton = 2,204.6 lbs
[3] Same as target depth presented in Appendix 5A
[4] Same as dilution factor presented in Appendix 5A

TABLE 5.2 ONONDAGA LAKE MONITORING SCOPE FOR 2020 NITRATE ADDITION

Date (Week of:)	South Deep # of Depths Sampled	Analysis Suite	Field Nitrate Profiling Locations	Zooplankton	Sediment Trap Mercury (10 m water depth)
4/5/2020			11		
4/12/2020			11		
4/19/2020			11		
4/26/2020			11		
5/3/2020			11		
5/10/2020	3	2,3	11	x	x
5/17/2020			11		x
5/24/2020			11		x
5/31/2020			11		x
6/7/2020			11		x
6/14/2020	3	2,3	11	x	x
6/21/2020			11		x
6/28/2020	3	2,3	11		x
7/5/2020	5	1,3,4	34,11	x	x
7/12/2020	4	2,3	34,11		x
7/19/2020	5	1,3,4	34,11	x	x
7/26/2020	4	2,3	34,11		x
8/2/2020	5	1,3,4	34,11	x	x
8/9/2020	4	2,3	34,11		x
8/16/2020	5	1,3,4	34,11	x	x
8/23/2020	4	2,3	34,11		x
8/30/2020	5	1,3,4	34,11	x	x
9/6/2020	4	2,3	34,11	x	x
9/13/2020	5	1,3,4	34,11	x	x
9/20/2020	4	2,3	34,11	x	x
9/27/2020	5	1,3,4	34,11	x	x
10/4/2020	4	2,3	34,11	x	x
10/11/2020	5	1,3,4	34,11	x	x
10/18/2020	4	2,3	34,11	x	x
10/25/2020	5	1,3,4	34,11	x	x
11/1/2020	3	2,3	11	x	x
11/15/2020	3	2,3	11	x	x

1: LLHg/meHg; 2: LLHg/meHg/diss-Hg; 3: NO_x/NO_2/ t-NH_3, 4: SRP

Additional Notes:
1. Sediment traps were deployed typically for seven days.
2. Sediment trap results for 2020 are reported in Section 4 of this report.
3. Fall turnover occurred on 28 October 2020 after which only three water depths were collected per sampling date.

TABLE 5.3 KEY NITRATE ADDITION INTER-ANNUAL VARIATIONS IN ONONDAGA LAKE

Year	Spring Turnover Nitrate-N, mg/L	Metric Tons of Calcium-Nitrate Applied	Duration of Summer Stratification, days*
2011	2.0	88	184
2012	2.6	72	163
2013	2.9	63	178
2014	2.3	57	167
2015	2.5	56	180
2016	2.5	67	191
2017	2.2	88	203
2018	1.6	105	172
2019	1.7	118	168
2020	2.3	78	176

* The duration of stratification is calculated from South Deep buoy profiles as the number of consecutive days with a temperature difference of at least 1°C between the surface and bottom waters (May 15 to October 28, 2020).

TABLE 5.4 2020 MERCURY CONCENTRATIONS (NG/L) IN SURFACE WATER NEAR THE LAKE BOTTOM AT THE 18-METER WATER DEPTH AT SOUTH DEEP, ONONDAGA LAKE

2020 Sampling Collection Date	Total Mercury	Validation Qualifier	Methyl Mercury	Validation Qualifier
12-May	1.46		0.027	J
16-Jun	1.00		0.026	U
30-Jun	0.62		0.026	U
06-Jul	0.62		0.026	U
14-Jul	0.74		0.026	U
21-Jul	0.85		0.026	U
28-Jul	1.85		0.049	J
04-Aug	0.82		0.026	U
11-Aug	0.65		0.054	
18-Aug	0.81		0.050	U
26-Aug	0.61		0.064	
01-Sep	1.06		0.084	
09-Sep	2.50		0.078	
15-Sep	2.96		0.055	
22-Sep	3.00		0.076	
29-Sep	4.06		1.780	
06-Oct	3.77		0.104	
13-Oct	5.04		0.073	
23-Oct	2.11		0.091	
27-Oct	5.35		0.048	J
04-Nov	1.79		0.025	U
18-Nov	5.16		0.026	U

U – not detected at reporting limit specified
J – estimated concentration

TABLE 5.5 2020 DISSOLVED MERCURY CONCENTRATIONS (NG/L) IN SURFACE WATER AT THE 2-METER WATER DEPTH AT SOUTH DEEP, ONONDAGA LAKE

2020 Sampling Collection Date	Total Dissolved Mercury (ng/L)	Validation Qualifier
05/12/2020	1.79	
06/16/2020	0.68	
06/30/2020	1.14	J
07/14/2020	1.07	
07/28/2020	0.58	J
08/11/2020	0.08	U
08/26/2020	0.08	U
09/09/2020	0.08	U
09/22/2020	0.33	J
10/06/2020	0.27	J
10/23/2020	0.14	J
10/27/2020	0.66	
11/04/2020	0.81	
11/18/2020	10.6	

U – not detected at reporting limit specified
J – estimated concentration

FIGURES



IN LAKE AND WETLAND PLANTED AREAS

COVER TYPE	2020 ACRES
OPEN FIELD/SCRUB SHRUB UPLAND	0.35
SCRUB SHRUB WETLAND	0.13
EMERGENT WETLAND	4.52
AQUATIC BED/FLOATING AQUATICS	13.35
UNCONSOLIDATED BED	0

NOTES:

1. TOTAL WETLAND ACREAGE TEMPORARILY LOST DURING REMEDIATION THAT REQUIRED RESTORATION OF THE NINEMILE CREEK SPITS TO MEET MITIGATION SUCCESS CRITERIA IS 1.9 ACRES (TABLE 7.5A OF THE OLMMP).
2. MITIGATION WETLAND ACREAGE WILL BE ACCESSED HOLISTICALLY ACROSS RESPECTIVE SITES THAT COMPROMISE THE MITIGATION AREAS TO DETERMINE IF MITIGATION ACREAGES HAVE BEEN ATTAINED.
3. THE DATA FROM THE VEGETATION MONITORING PROGRAM ARE USED TO ESTIMATE ANNUAL WETLAND ACRES BASED ON VEGETATIVE COVER TYPES IN YEARS WHERE A FORMAL SURVEY OR DELINEATION ARE NOT REQUIRED. IN YEAR THREE, A FORMAL WETLAND SURVEY WAS PERFORMED BY A CERTIFIED WETLAND DELINEATOR BASED ON VEGETATION AND HYDROLOGY. IN YEAR FIVE, A WETLAND DELINEATION CARRIED OUT PER USACOE (USACOE, 2012) AND NYSDEC (NYSDEC, 1995) METHODS WILL BE COMPLETED TO QUANTIFY WETLAND MITIGATION ACREAGE, AS PER THE OLMMP.



KEY PLAN
NOT TO SCALE

LEGEND:

- LAKE CONTOURS–1' INTERVAL (POST REMEDY CONTOURS SHOWN)
- SHORELINE
- REMEDIATION AREA CAP BOUNDARY
- PROTECTIVE EDGE
- SHORELINE STABILIZATION

150 0 150 300

SCALE: 1"=150'

FILE NAME: P:\HONEYWELL –SYR\450704 2017–2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704_VEG_2020–NMC–MOUTH.DWG
PLOT DATE: 7/21/2021 1:42 PM PLOTTED BY: RUSSO, JILL

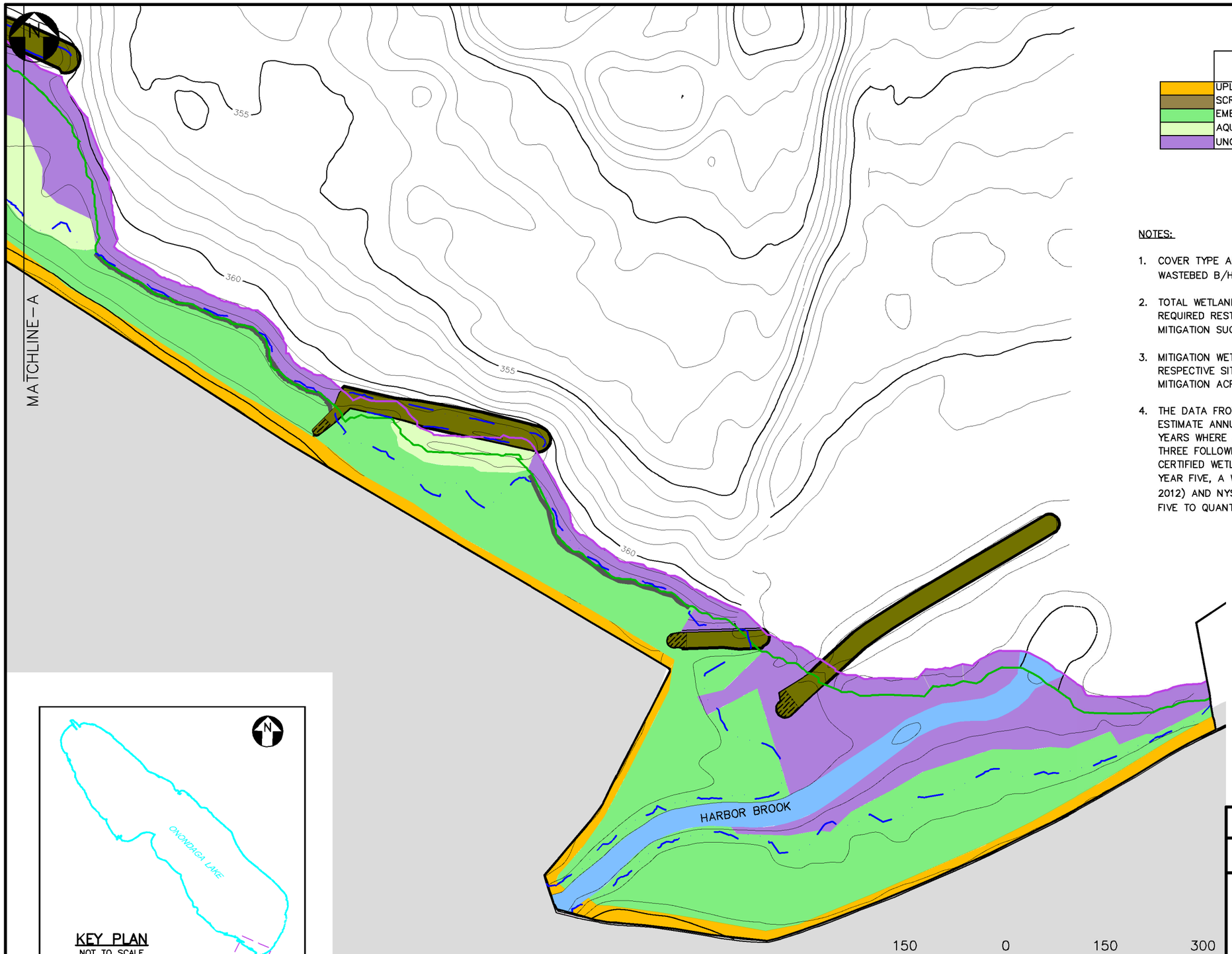
FIGURE 2.1

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

MOUTH OF NINEMILE CREEK
VEGETATION COVER TYPES
2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560



IN LAKE AND WETLAND PLANTED AREAS

COVER TYPE	2020 ACREAGES OUTBOARD	2020 ACREAGES 25' BUFFER
UPLAND	2.06	0.01
SCRUB SHRUB WETLAND	1.18	–
EMERGENT WETLAND	7.43	0.03
AQUATIC BED/FLOATING AQUATICS	0.82	0.30
UNCONSOLIDATED BED	3.01	1.90

NOTES:

1. COVER TYPE ACREAGES ARE CALCULATED FOR BOTH EASTERN AND WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREAS.
2. TOTAL WETLAND ACREAGE TEMPORARILY LOST DURING REMEDIATION THAT REQUIRED RESTORATION INSIDE OF THE OUTBOARD BOUNDARY TO MEET MITIGATION SUCCESS CRITERIA IS 7.5 ACRES (TABLE 7.5A OF THE OLMMP).
3. MITIGATION WETLAND ACREAGE WILL BE ACCESSED HOLISTICALLY ACROSS RESPECTIVE SITES THAT COMPROMISE THE MITIGATION AREAS TO DETERMINE IF MITIGATION ACREAGES HAVE BEEN ATTAINED.
4. THE DATA FROM THE VEGETATION MONITORING PROGRAM ARE USED TO ESTIMATE ANNUAL WETLAND ACRES BASED ON VEGETATIVE COVER TYPES IN YEARS WHERE A FORMAL SURVEY OR DELINEATION ARE NOT REQUIRED. IN YEAR THREE FOLLOWING, A FORMAL WETLAND SURVEY WILL BE PERFORMED BY A CERTIFIED WETLAND DELINEATOR BASED ON VEGETATION AND HYDROLOGY. IN YEAR FIVE, A WETLAND DELINEATION CARRIED OUT PER USACOE (USACOE, 2012) AND NYSDEC (NYSDEC, 1995) METHODS WILL BE COMPLETED IN YEAR FIVE TO QUANTIFY WETLAND MITIGATION ACREAGE, AS PER THE OLMMP.

LEGEND:

- LAKE CONTOURS–1' INTERVAL (POST REMEDY CONTOURS SHOWN)
- SHORELINE
- OUTBOARD BOUNDARY
- 25' PLANTED BUFFER LIMIT
- REMEDIATION AREA CAP BOUNDARY
- PROTECTIVE EDGE
- PROTECTIVE BERMS

KEY PLAN
NOT TO SCALE

FIGURE 2.2

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

EASTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA COVER TYPES 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\450704 2017–2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\VEG COVER\450704_VEG_2020–002.DWG
PLOT DATE: 7/21/2021 2:21 PM PLOTTED BY: RUSSO, JILL

IN LAKE AND WETLAND PLANTED AREAS

COVER TYPE	2020 ACREAGES OUTBOARD	2020 ACREAGES 25' BUFFER
UPLAND	2.06	0.01
SCRUB SHRUB WETLAND	1.18	–
EMERGENT WETLAND	7.43	0.03
AQUATIC BED/FLOATING AQUATICS	0.82	0.30
UNCONSOLIDATED BED	3.01	1.90

NOTE:

1. COVER TYPE ACREAGES ARE CALCULATED FOR BOTH EASTERN AND WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREAS.



LEGEND:

- LAKE CONTOURS–1' INTERVAL (POST REMEDY CONTOURS SHOWN)
- SHORELINE
- OUTBOARD BOUNDARY
- 25' PLANTED BUFFER LIMIT
- REMEDIATION AREA CAP BOUNDARY
- PROTECTIVE EDGE
- PROTECTIVE BERMS



KEY PLAN
NOT TO SCALE

150 0 150 300

SCALE: 1"=150'

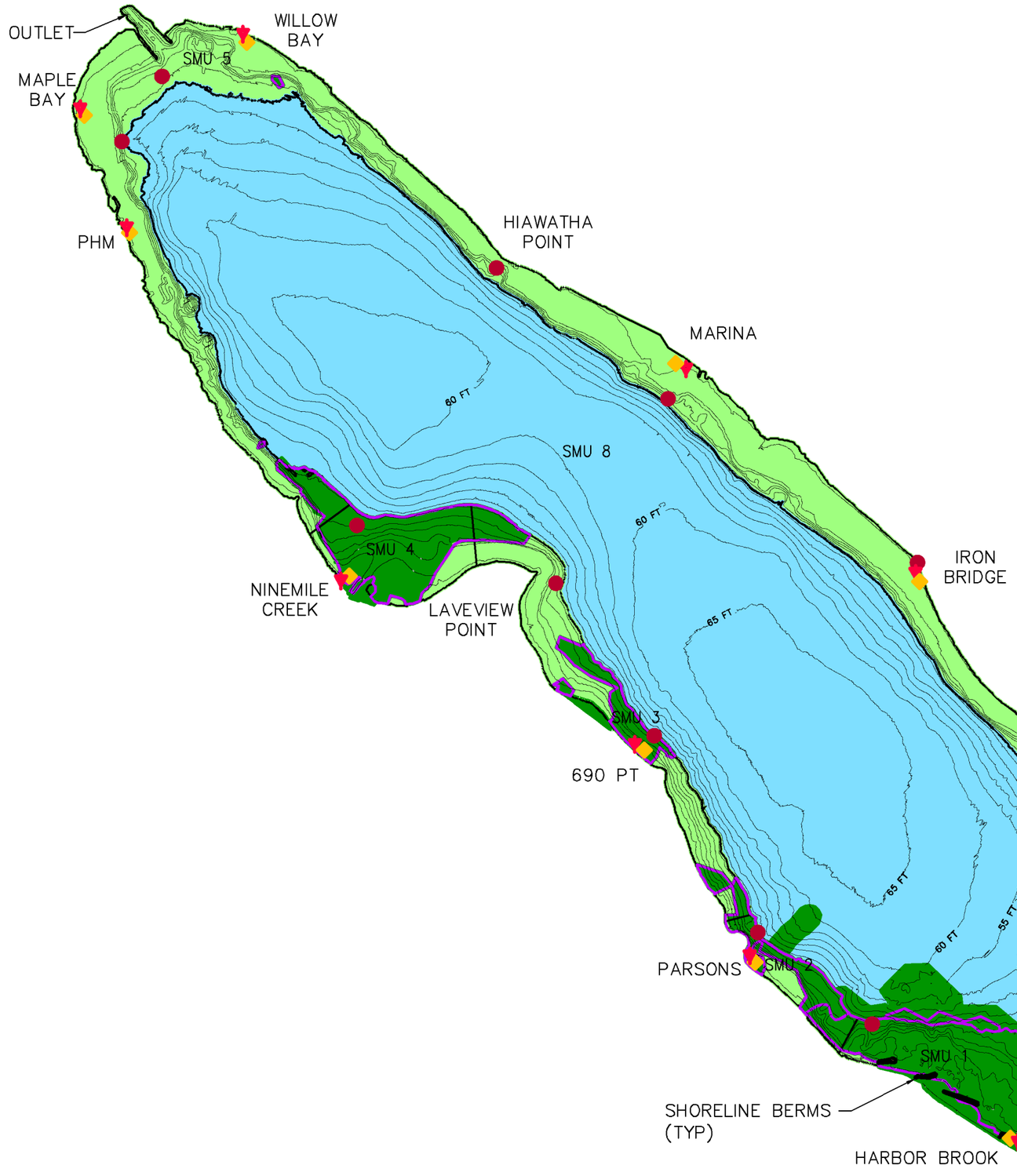
FIGURE 2.3

Honeywell ONONDAGA LAKE SYRACUSE, NEW YORK

WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA COVER TYPES 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\450704 2017–2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\VEG COVER\450704_VEG_2020–002.DWG
PLOT DATE: 7/21/2021 2:27 PM PLOTTED BY: RUSSO, JILL



TRAP NET

GILL NET

SEINE

REMEDIATION AREA BOUNDARY

SMU BOUNDARY

PROFUNDAL ZONE (SMU 8)

LITTORAL ZONE

CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

CSX SHORELINE

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. SEINE SITES CO-LOCATED WITH SMALL PREY FISH TISSUE COLLECTION LOCATIONS (DETAILED IN SECTION 3 OF THIS REPORT).
3. EXACT LOCATIONS WERE ADJUSTED SLIGHTLY IN THE FIELD BASED ON WATER DEPTH AND WITH THE INTENT OF BEING PROTECTIVE OF NEWLY INSTALLED VEGETATION (WHERE APPLICABLE).

2000 1000 0 2000 4000

SCALE: 1"=2000'

FIGURE 2.4

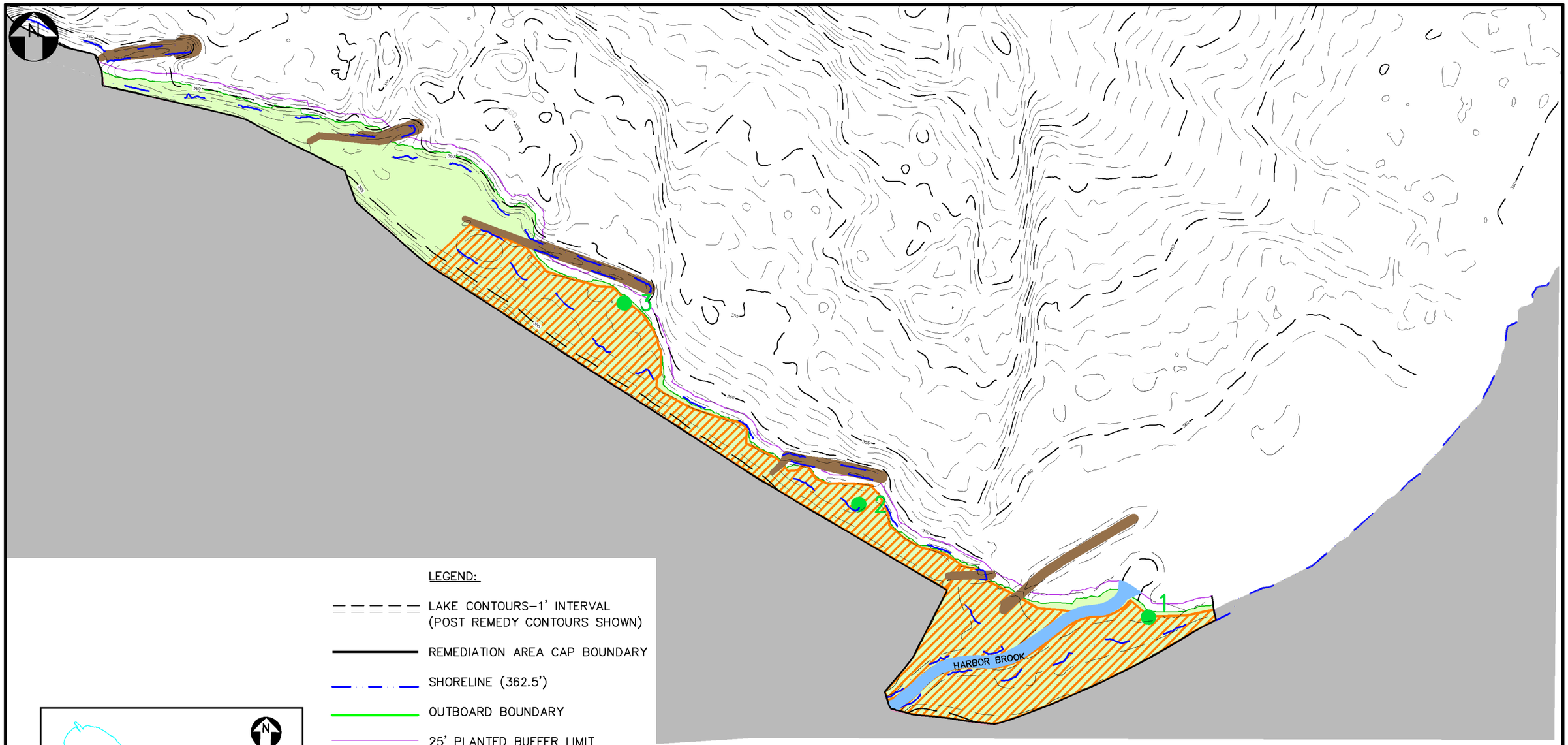
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

2020 FISH COMMUNITY SAMPLING LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704-MNR-FISH-2020.DWG
PLOT DATE: 7/19/2021 12:21 PM PLOTTED BY: RUSSO, JILL



LEGEND:

- LAKE CONTOURS–1' INTERVAL (POST REMEDY CONTOURS SHOWN)
- REMEDIATION AREA CAP BOUNDARY
- SHORELINE (362.5')
- OUTBOARD BOUNDARY
- 25' PLANTED BUFFER LIMIT
- PLANTED AREAS
- PROTECTIVE BERMS
- TRAPNET LOCATIONS (ADULT SPAWNING)
- DIPNET, MINNOW TRAPS, AND VISUAL INSPECTIONS



KEY PLAN
NOT TO SCALE

300 150 0 300 600

SCALE: 1"=300'

FIGURE 2.5

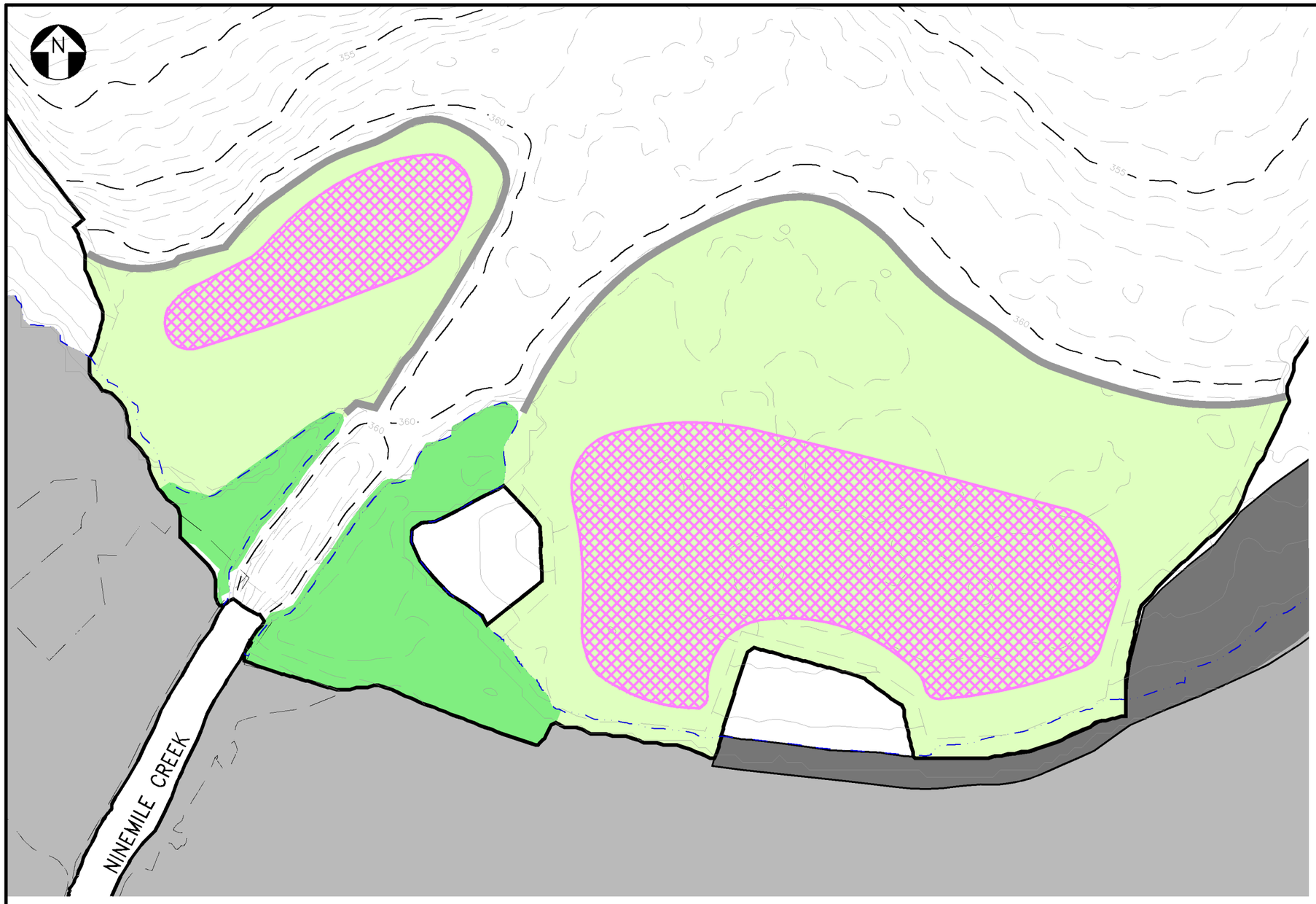
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

2020 WETLAND SPAWNING ADULT AND JUVENILE MONITORING LOCATIONS

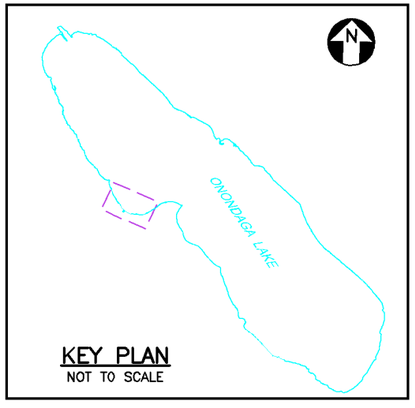
PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704-ANNUALRPT-SPAWN-2020.DWG
PLOT DATE: 7/19/2021 12:16 PM PLOTTED BY: RUSSO, JILL



LEGEND:

- LAKE CONTOURS–1' INTERVAL (POST REMEDY CONTOURS SHOWN)
- PROTECTIVE EDGE
- REMEDIATION AREA A BOUNDARY
- SHORELINE (362.5')
- SHORELINE STABILIZATION AND ENHANCEMENT AREA
- NINEMILE CREEK SPITS
- PLANTED AREAS
- FOCUS AREA



KEY PLAN
NOT TO SCALE

150 0 150 300

SCALE: 1"=150'

FIGURE 2.6

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

MOUTH OF NINEMILE CREEK
FOCUS AREAS FOR 2021

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704_FOCUS_NMC-MOUTH-2020.DWG
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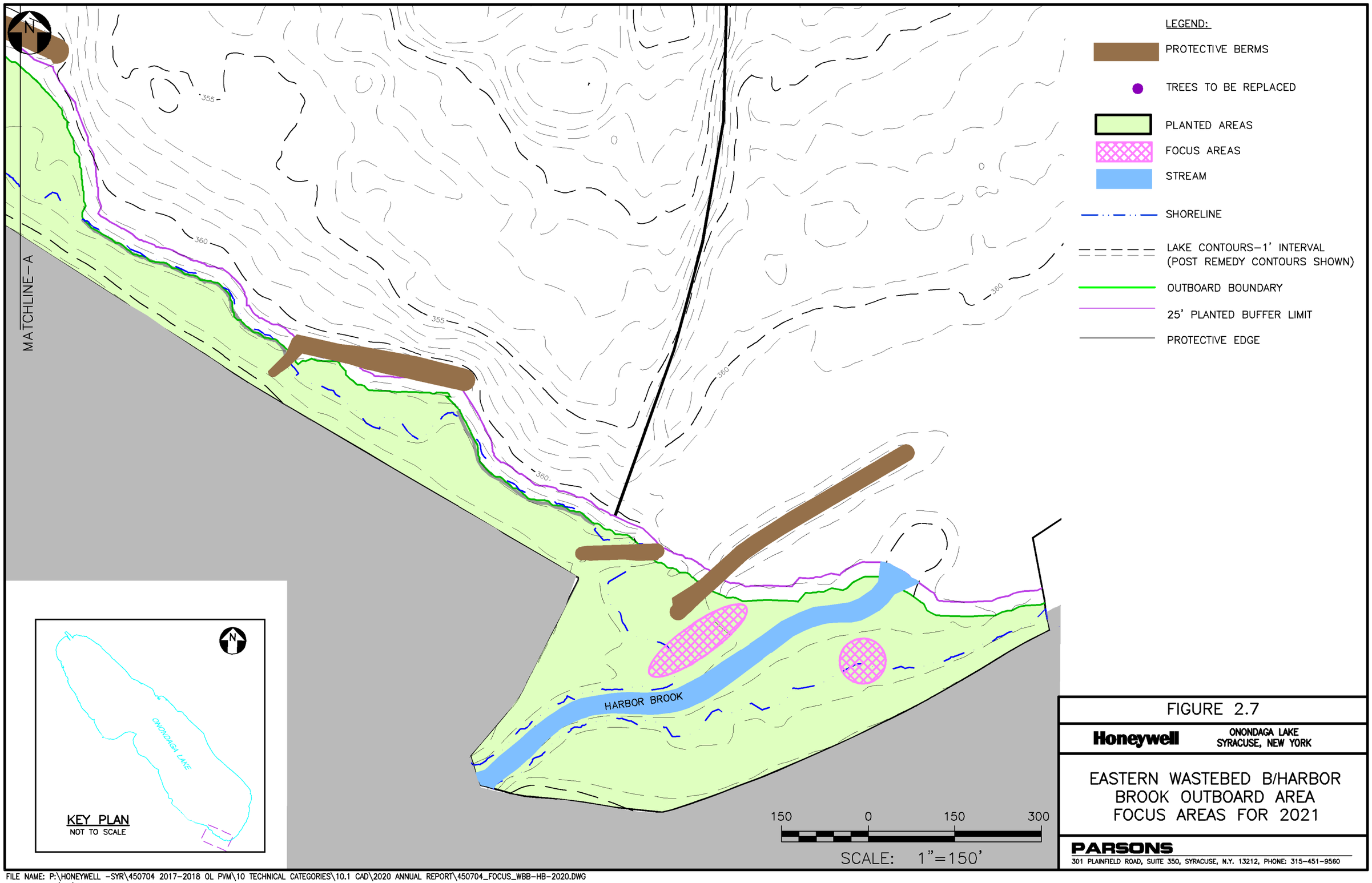


FIGURE 2.7

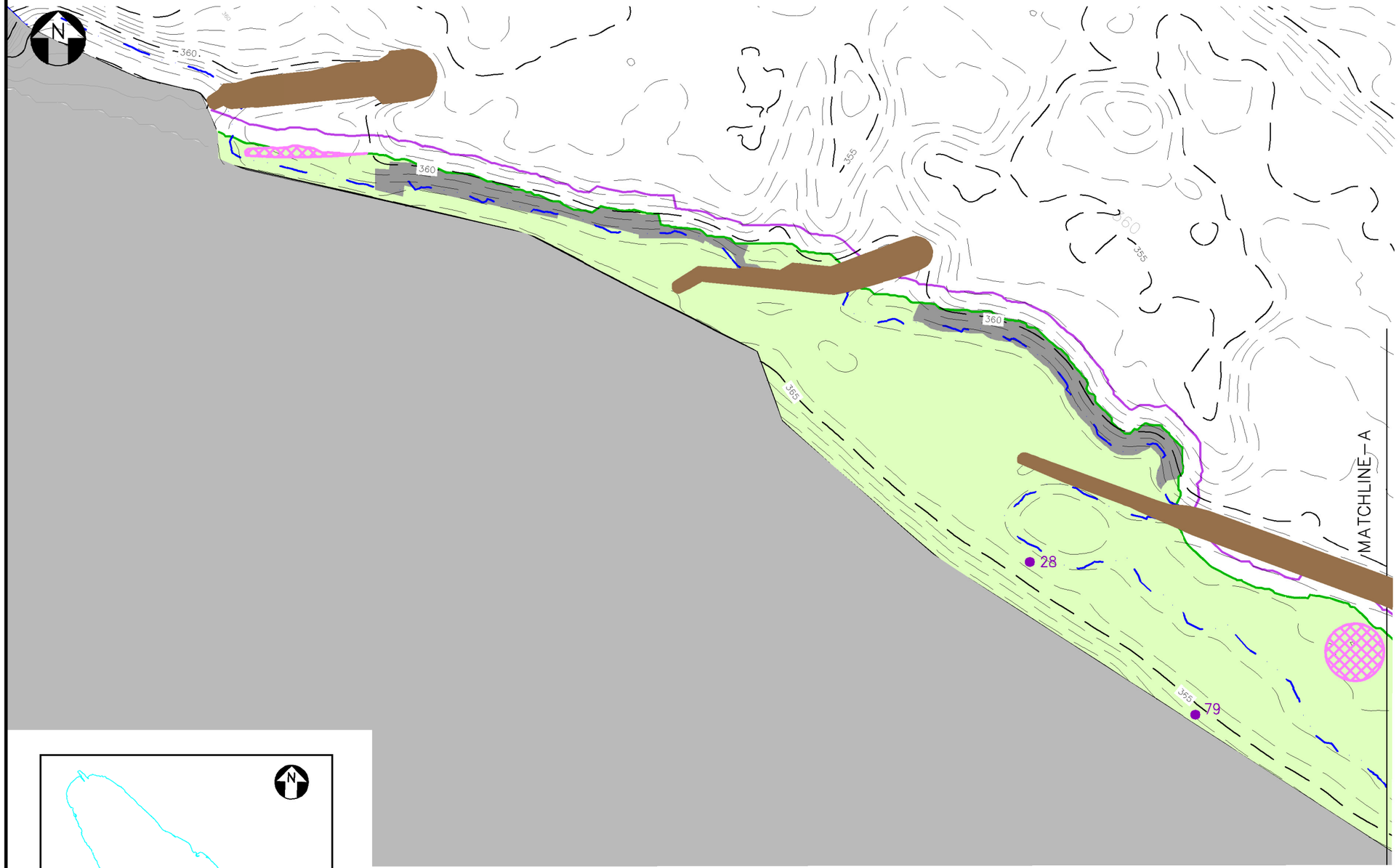
Honeywell

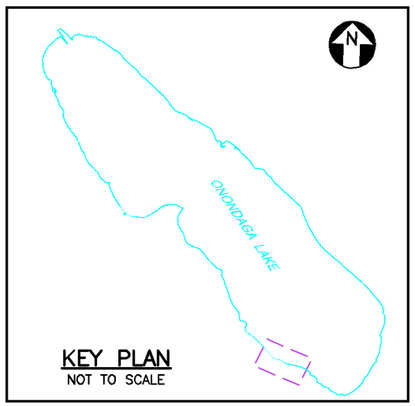
ONONDAGA LAKE
SYRACUSE, NEW YORK

EASTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA FOCUS AREAS FOR 2021

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704_FOCUS_WBB-HB-2020.DWG
PLOT DATE: 7/19/2021 10:42 AM PLOTTED BY: RUSSO, JILL





150 0 150 300

SCALE: 1"=150'

FIGURE 2.8

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA FOCUS AREAS FOR 2021

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\450704 2017–2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704_FOCUS_WBB–HB–2020.DWG
PLOT DATE: 7/19/2021 10:40 AM PLOTTED BY: RUSSO, JILL



LEGEND:

- ZOOPLANKTON SAMPLE LOCATION
- SMALL PREY FISH LOCATIONS
- ADULT SPORT FISH AND LARGE PREY FISH LOCATIONS
- REMEDIATION AREA BOUNDARY
- SMU BOUNDARY
- SMU 8
- LITTORAL ZONE
- CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

2000 1000 0 2000 4000

SCALE: 1"=2000'

FIGURE 3.1

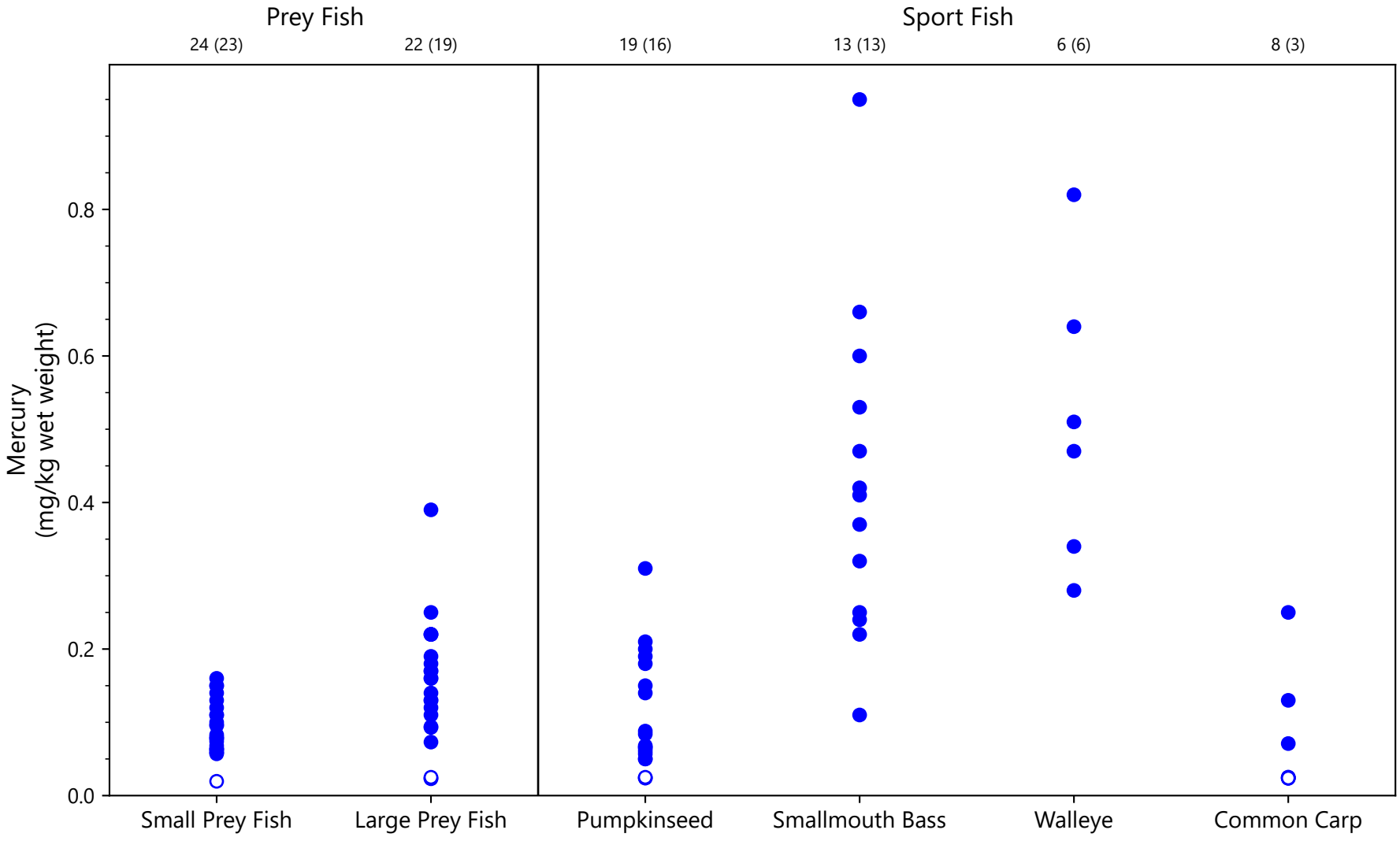
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

SAMPLING LOCATIONS FOR ZOOPLANKTON AND FISH TISSUE AND CHEMICAL ANALYSIS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2019 ANNUAL REPORT\450704-2019-ZOO-FISH.DWG
PLOT DATE: 6/18/2021 2:55 PM PLOTTED BY: RUSSO, JILL

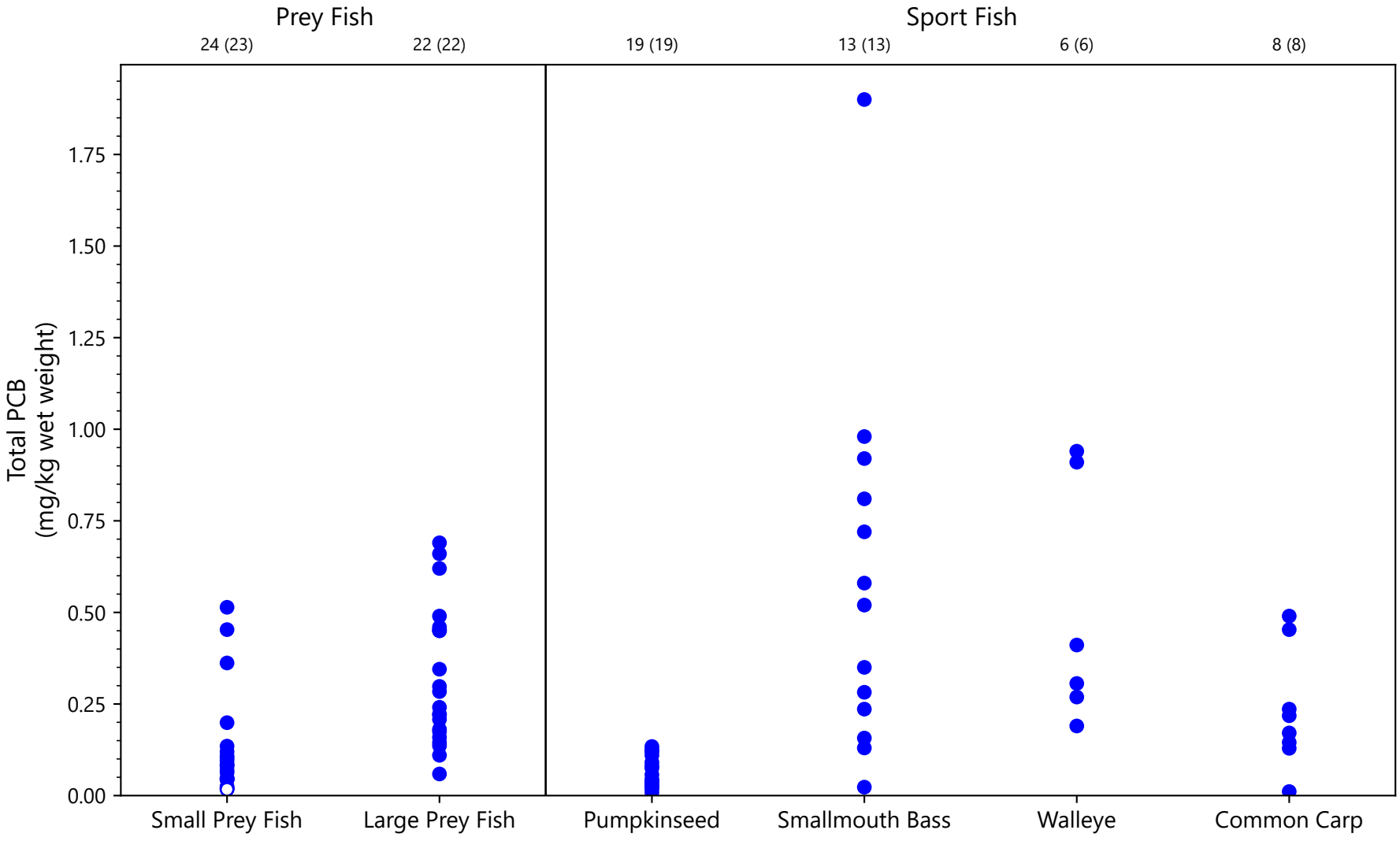


Open symbols indicate non-detects, reported at half the method detection limit.
Number of samples provided above the plot with number of detected results in parentheses.
Incomplete 2020 dataset due to incomplete homogenization for a subset of samples.

Publish Date: 08/28/2024 16:09 PM | User: BAL-DGRA2
\\WCL-FS1\Syracuse\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2020_OMM\Python\Species_scatterplots_AQGraphicUpdate.py

ANCHOR QEA

Figure 3.2
Scatter Plot of Mercury Concentrations in Onondaga Lake Fish (2020)

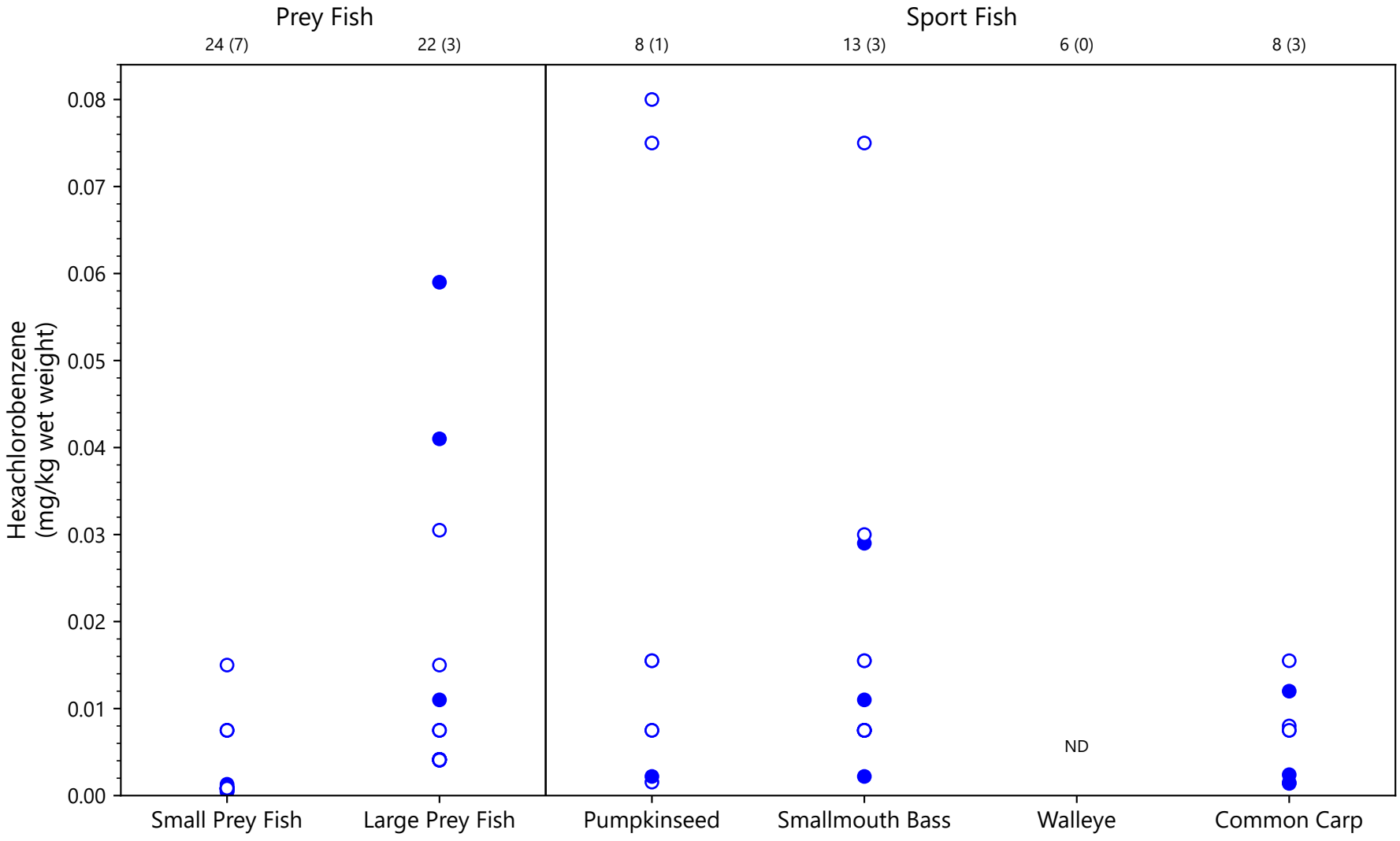


Open symbols indicate non-detects, reported at half the reporting limit.
Number of samples provided above the plot with number of detected results in parentheses.
Incomplete 2020 dataset due to incomplete homogenization for a subset of samples.

Publish Date: 08/28/2024 16:09 PM | User: BAL-DGRA2
\\WCL-FS1\Syracuse\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2020_OMM\Python\Species_scatterplots_AQGraphicUpdate.py

ANCHOR QEA

Figure 3.3
Scatter Plot of Total PCB Concentrations in Onondaga Lake Fish (2020)

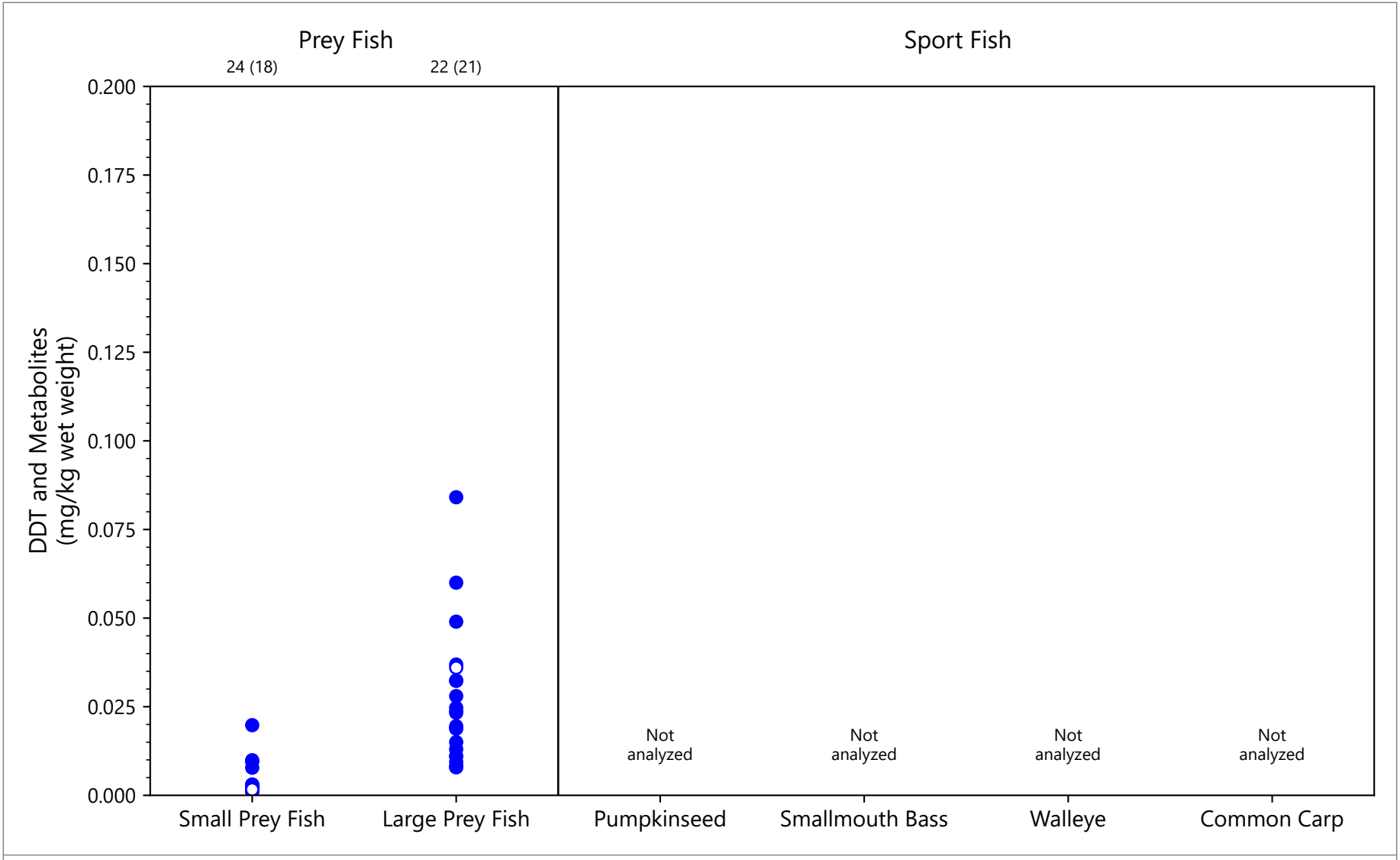


Open symbols indicate non-detects, reported at half the reporting limit.
Number of samples provided above the plot with number of detected results in parentheses.
Incomplete 2020 dataset due to incomplete homogenization for a subset of samples.

Publish Date: 08/28/2024 16:09 PM | User: BAL-DGRA2
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ANCHOR QEA

Figure 3.4
Scatter Plot of Hexachlorobenzene Concentrations in Onondaga Lake Fish (2020)

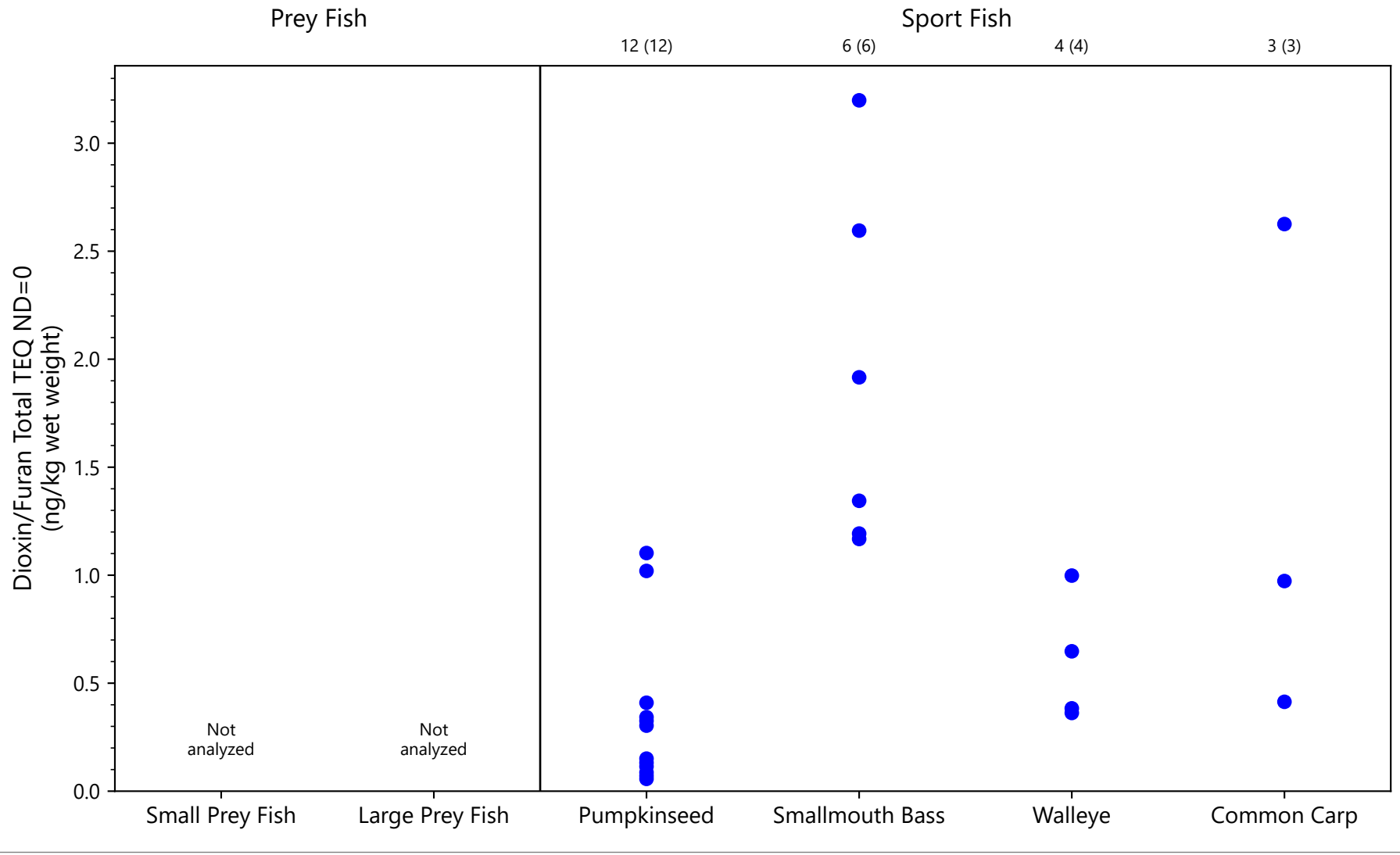


Open symbols indicate non-detects, reported at half the reporting limit.
Number of samples provided above the plot with number of detected results in parentheses.
Incomplete 2020 dataset due to incomplete homogenization for a subset of samples.

Publish Date: 08/28/2024 16:09 PM | User: BAL-DGRA2
\\WCL-FS1\Syracuse\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2020_OMM\Python\Species_scatterplots_AQGraphicUpdate.py

ANCHOR QEA

Figure 3.5
Scatter Plot of DDT and Metabolites Concentrations in Onondaga Lake Fish (2020)

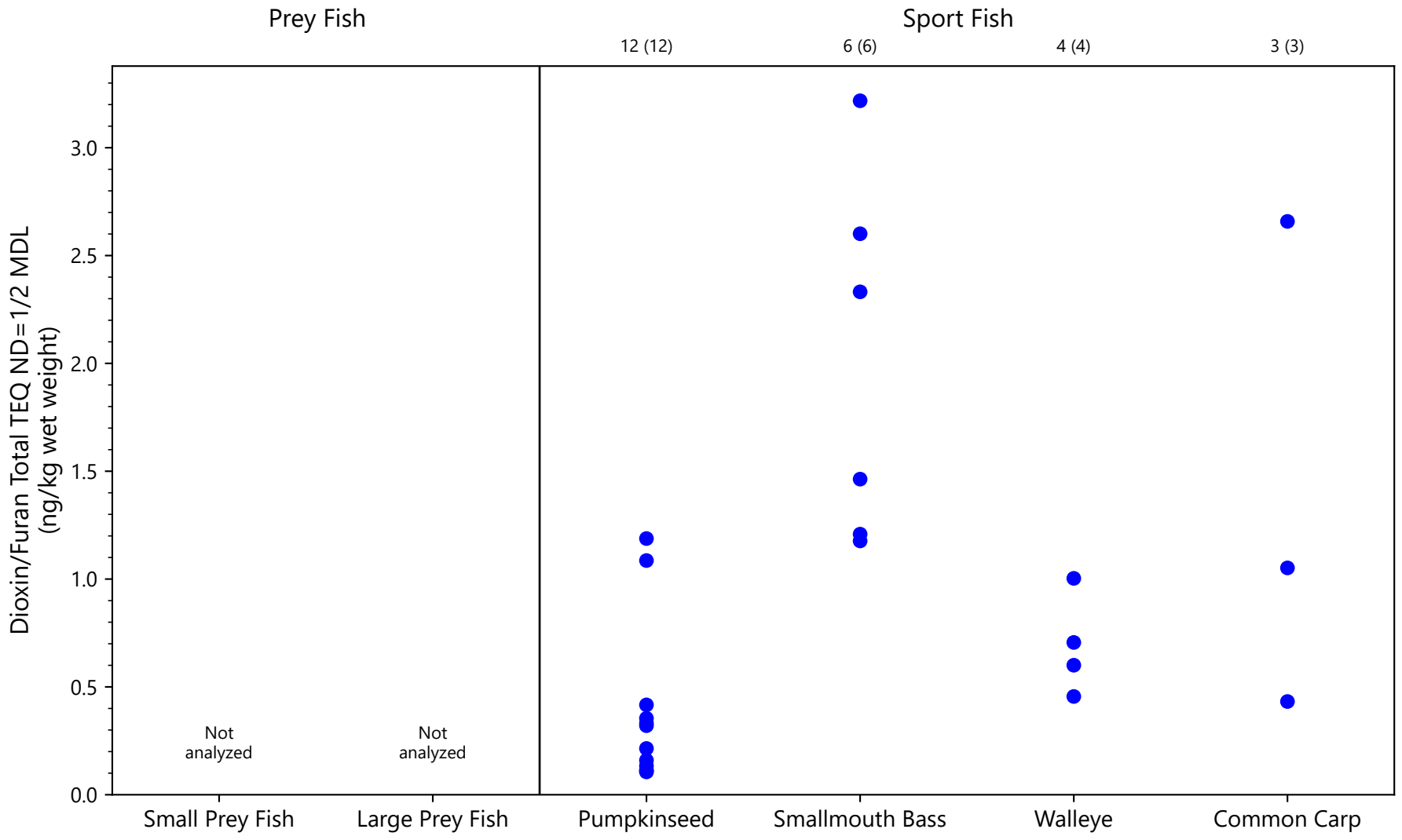


Open symbols indicate non-detects, reported at half the method detection limit.
Number of samples provided above the plot with number of detected results in parentheses.
Incomplete 2020 dataset due to incomplete homogenization for a subset of samples.

Publish Date: 08/28/2024 16:09 PM | User: BAL-DGRA2
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ANCHOR QEA

Figure 3.6
Scatter Plot of Dioxin/Furan Total TEQ (ND=0) Concentrations in Onondaga Lake Fish (2020)

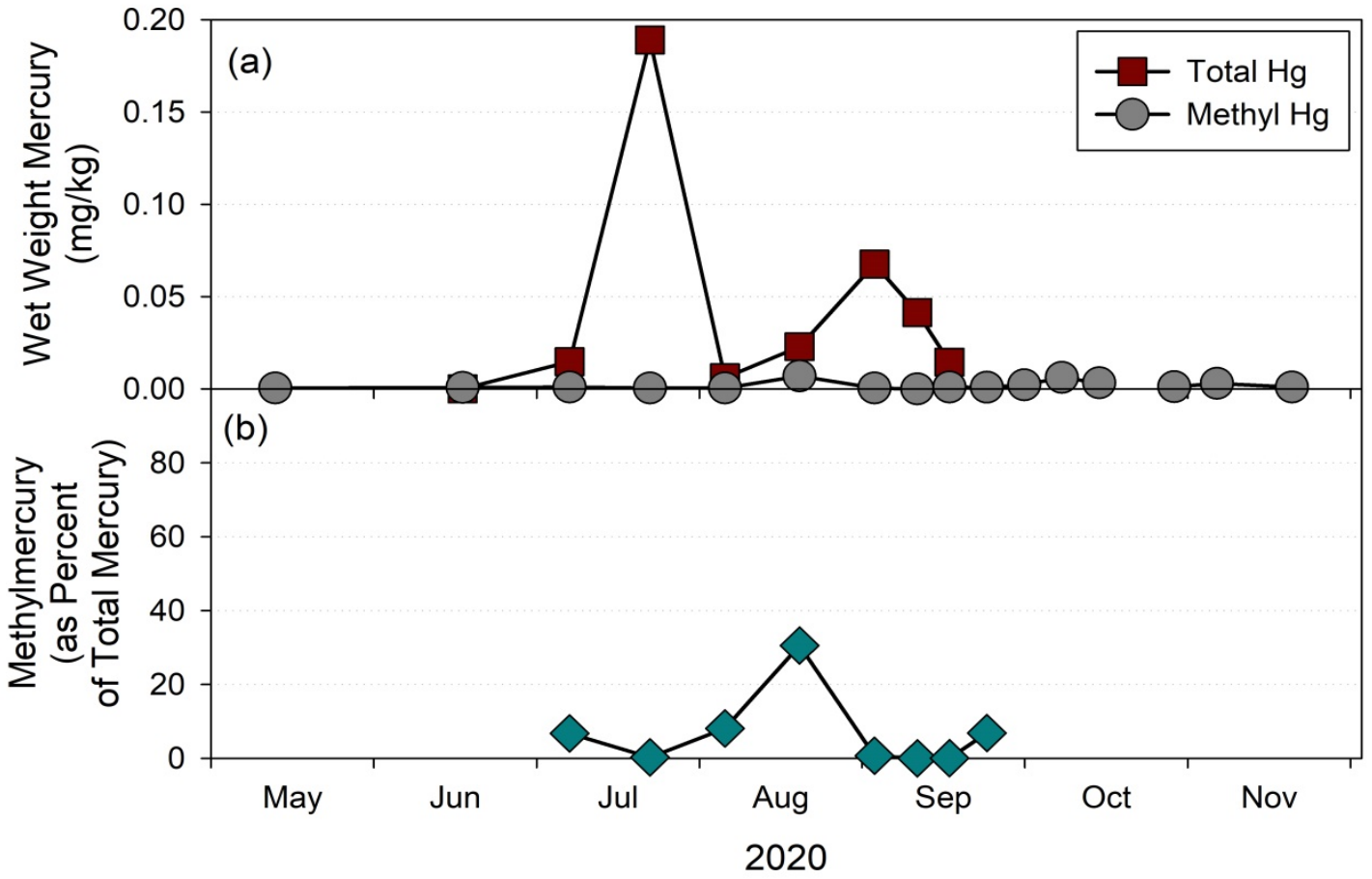


Open symbols indicate non-detects, reported at half the method detection limit.
Number of samples provided above the plot with number of detected results in parentheses.
Incomplete 2020 dataset due to incomplete homogenization for a subset of samples.

Publish Date: 08/28/2024 16:09 PM | User: BAL-DGRA2
\\WCL-FS1\Syracuse\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2020_OMM\Python\Species_scatterplots_AQGraphicUpdate.py

ANCHOR QEA

Figure 3.7
Scatter Plot of Dioxin/Furan Total TEQ (ND=1/2 MDL) Concentrations in Onondaga Lake Fish (2020)



(a) Total Mercury (Hg) and Methylmercury (MeHg) (October 20 sample omitted as described in text)
(b) Percentage Total Mercury Measured as Methylmercury
Note: Plot does not include the June 16 sample due to both methylmercury and total mercury being non-detects.

FIGURE 3.8

Honeywell

Onondaga Lake
Syracuse, New York

Wet Weight Mercury Concentrations in Zooplankton Collected from South Deep in 2020

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560

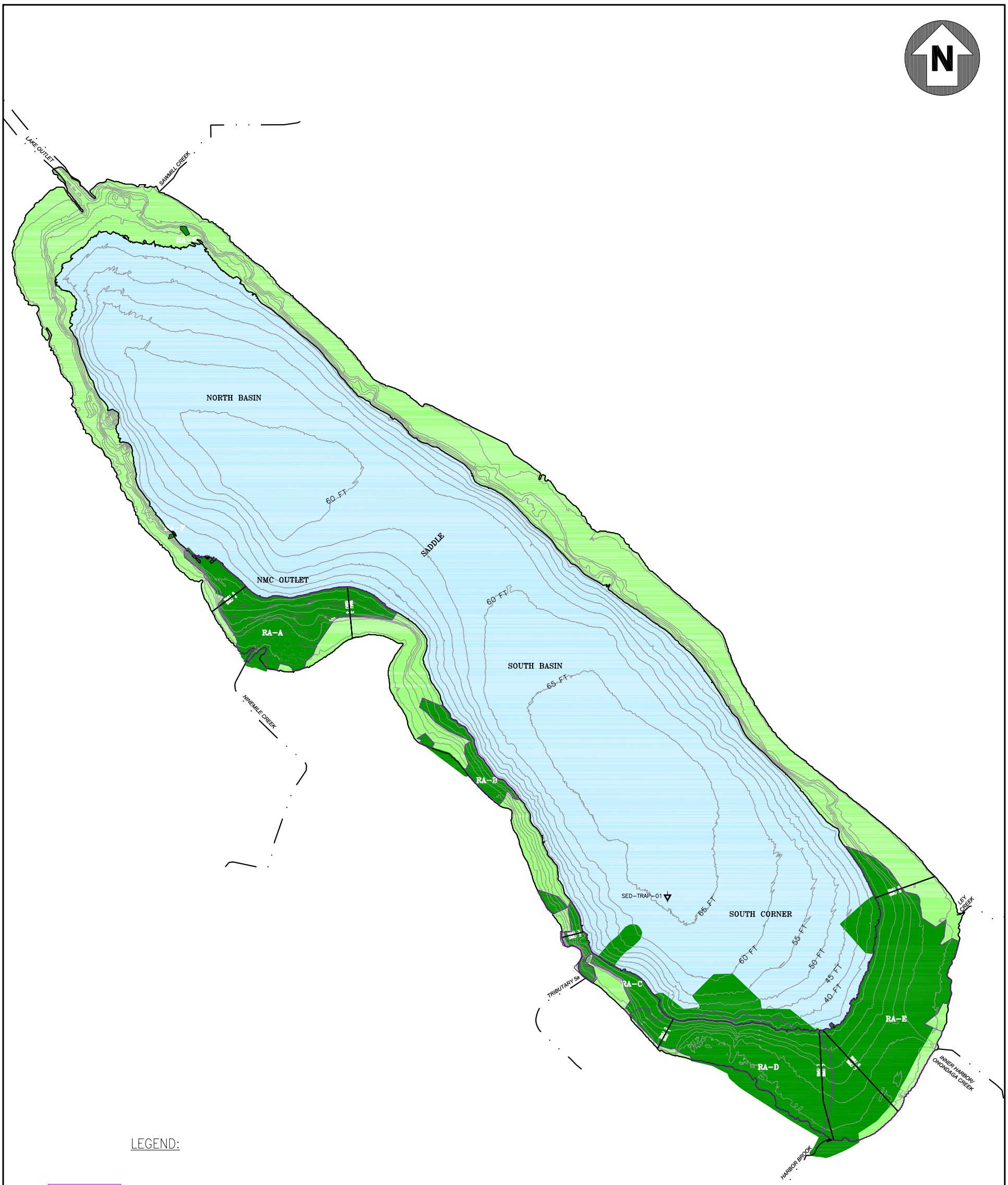


FIGURE 4.1

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

SEDIMENT TRAP SAMPLING LOCATION

PARSONS
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FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2019\450102-MNR-2019-SED TRAP.DWG
PLOT DATE: 6/22/2021 10:20 AM PLOTTED BY: RUSSO, JILL



Date Revised: 3/2/2021 12:24:12 PM

Path: Q:\GIS\GIS_Lake\Baseline_Monitor\MXDs\2020_NitrateInjectLocs.mxd

2020 Nitrate Application Locations

Bathymetry Contours For Water Depth

10 Foot Intervals

30 Foot Water Depth Contour

0 1,200 2,400 4,800 7,200

Feet

Figure 5.1

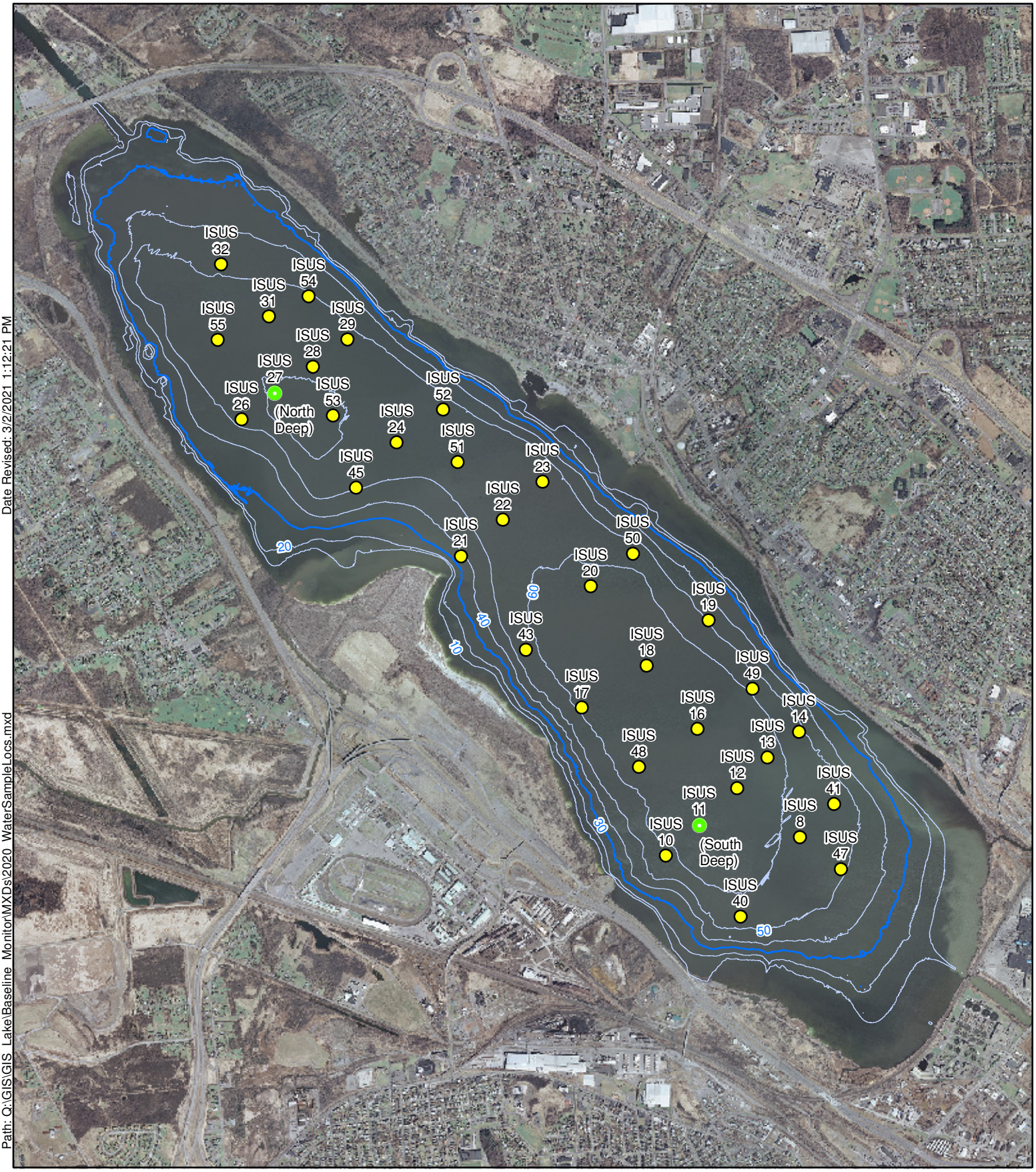
Honeywell

Onondaga Lake
Syracuse, New York

2020 Nitrate Application Locations

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North Deep and South Deep

ISUS-SUNA Monitoring Location

Bathymetry Contours For Water Depth

10 Foot Intervals

30 Foot Water Depth Contour

0 1,200 2,400 4,800 7,200

Feet

Figure 5.2

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Onondaga Lake
Syracuse, New York

2020 ISUS-SUNA
Monitoring Locations

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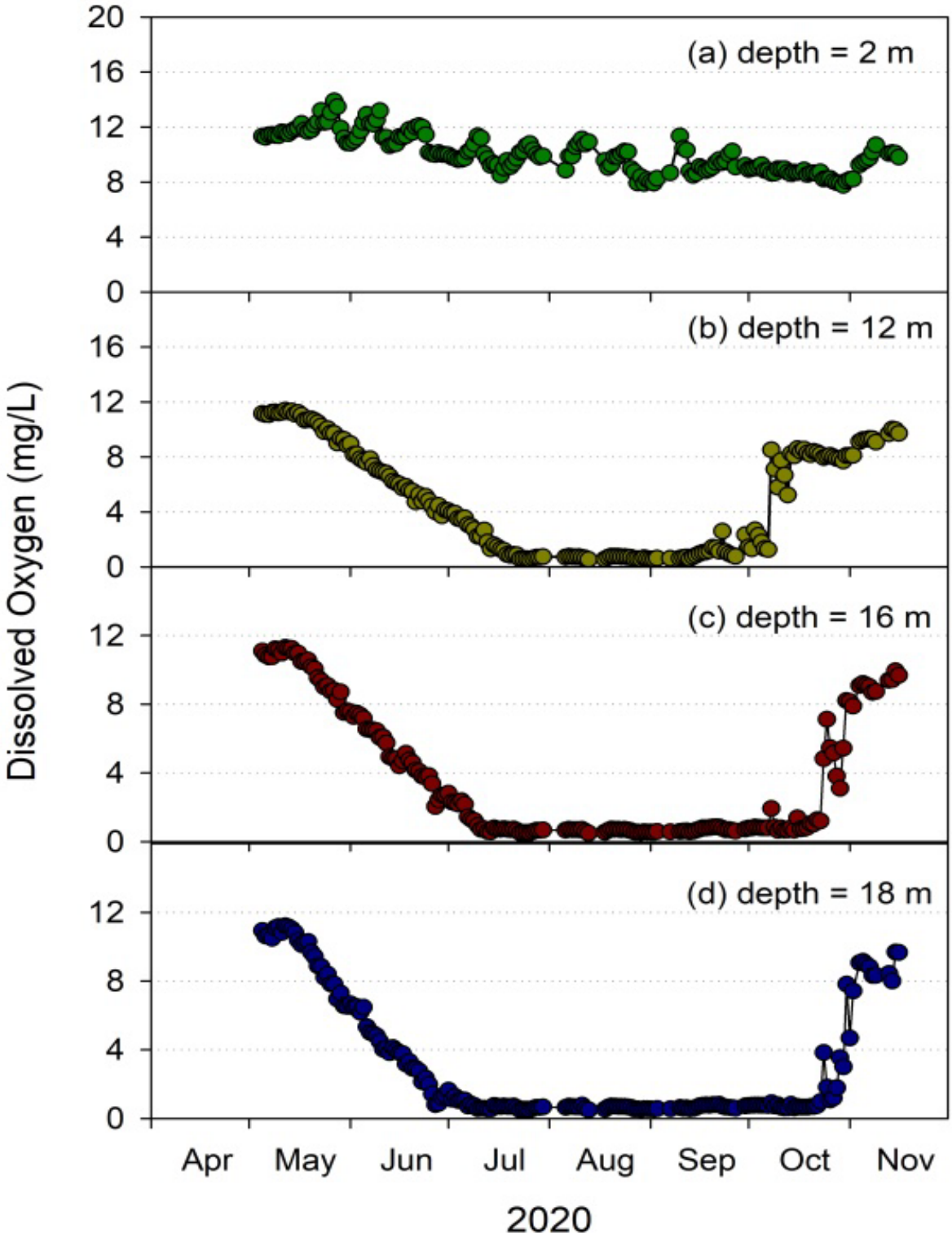


FIGURE 5.3

Honeywell

Onondaga Lake
Syracuse, New York

Measurements of Dissolved Oxygen from the Onondaga Lake South Deep Buoy in 2020: (a) 2, (b) 12, (c) 16, and (d) 18-Meter Water Depths.

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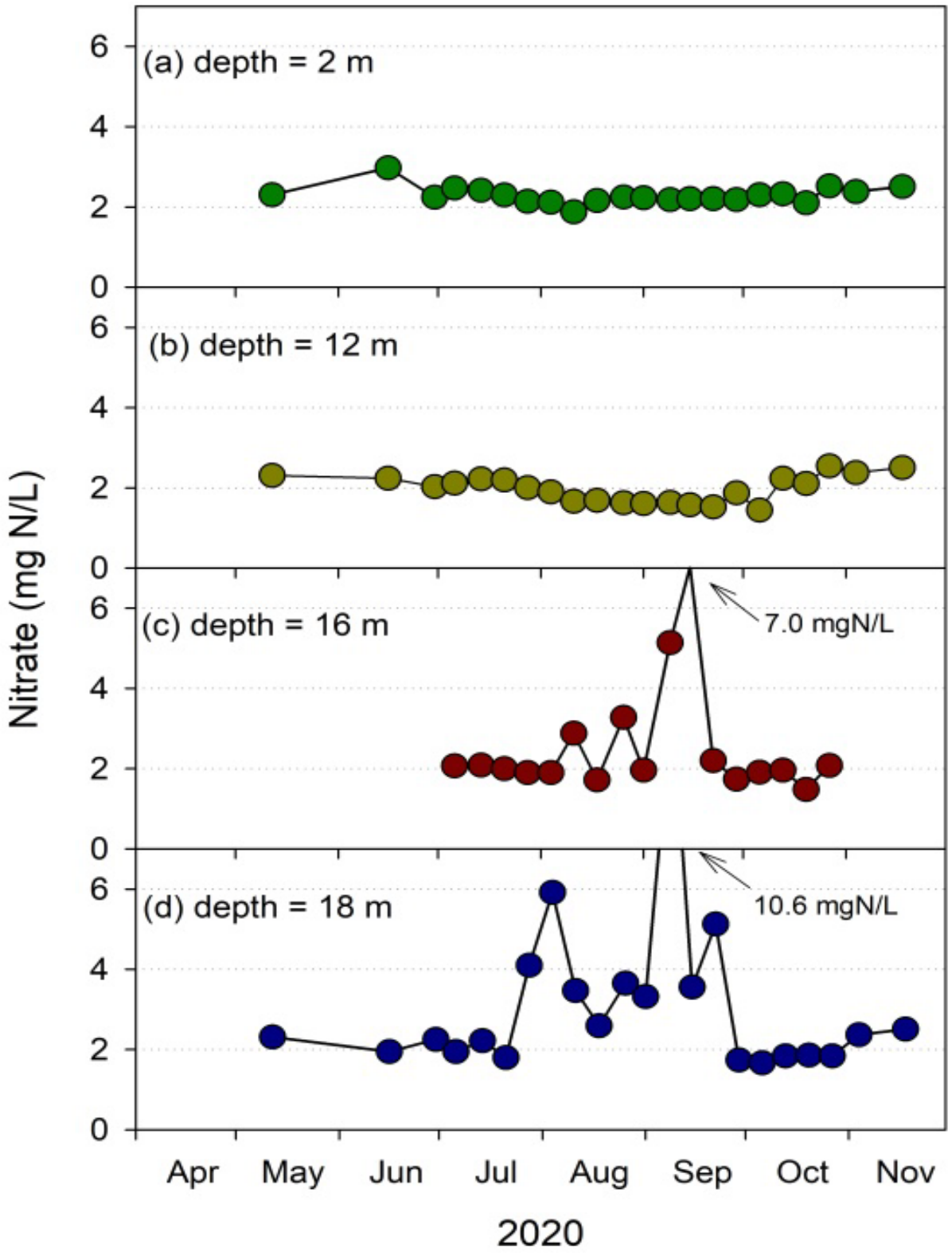


FIGURE 5.4

Honeywell

Onondaga Lake
Syracuse, New York

Laboratory Measurements of Nitrate at Onondaga Lake South Deep in 2020: (a) 2, (b) 12, (c) 16, and (d) 18-meter water depths

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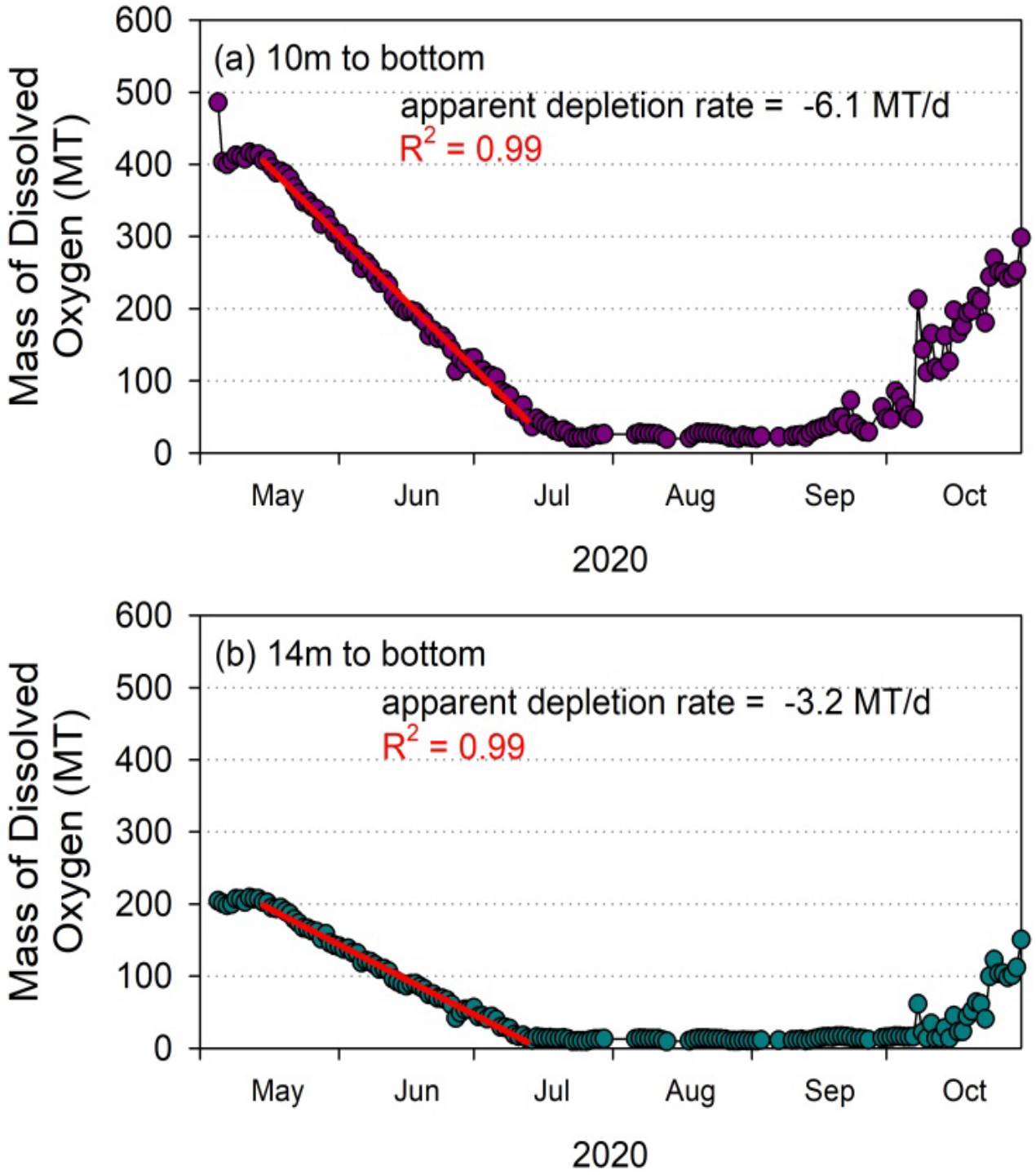


FIGURE 5.5

Honeywell

Onondaga Lake
Syracuse, New York

Dissolved Oxygen Mass in Hypolimnion During 2020 Summer Stratification: (a) 10 meters to the bottom and (b) 14 meters to the bottom

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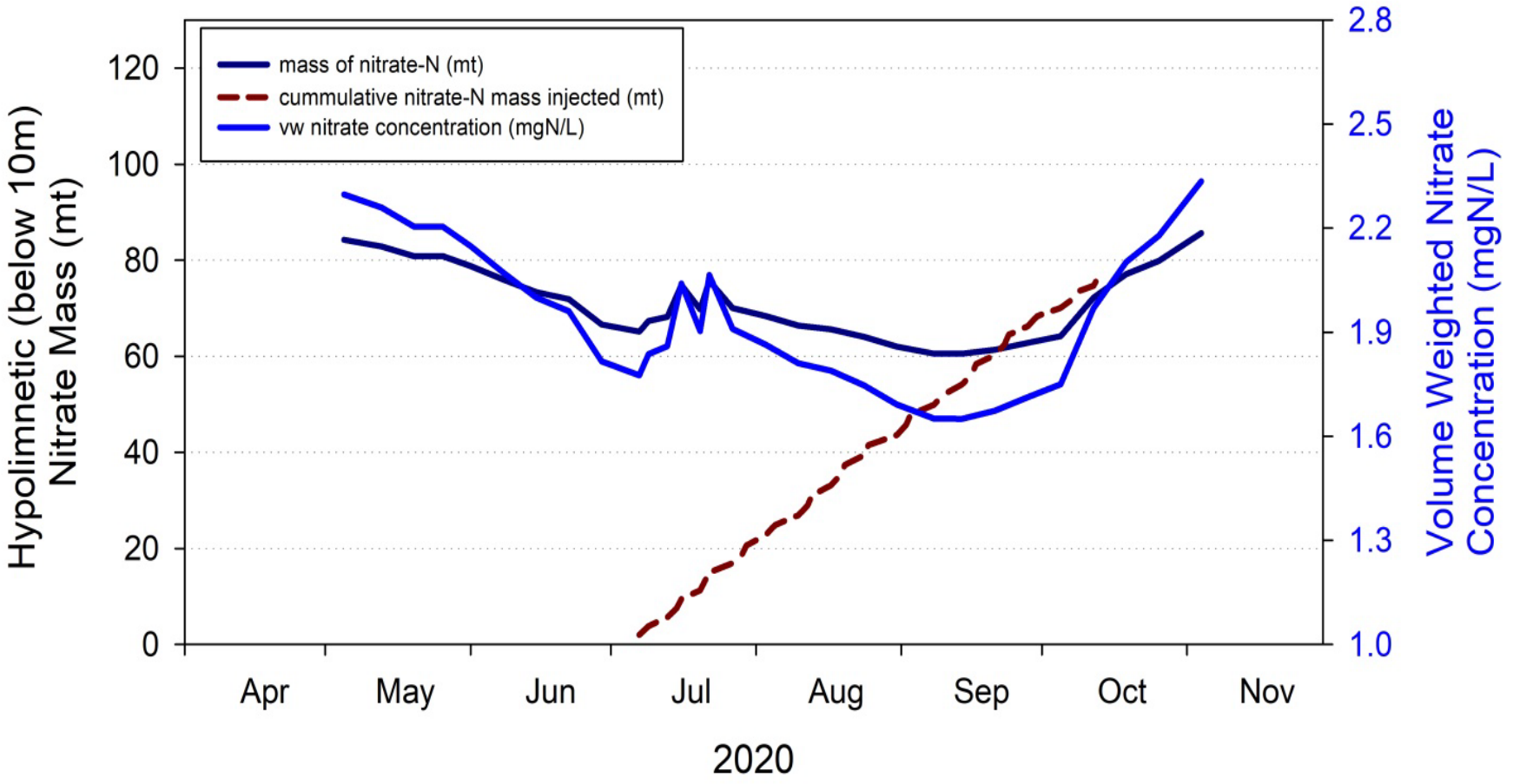


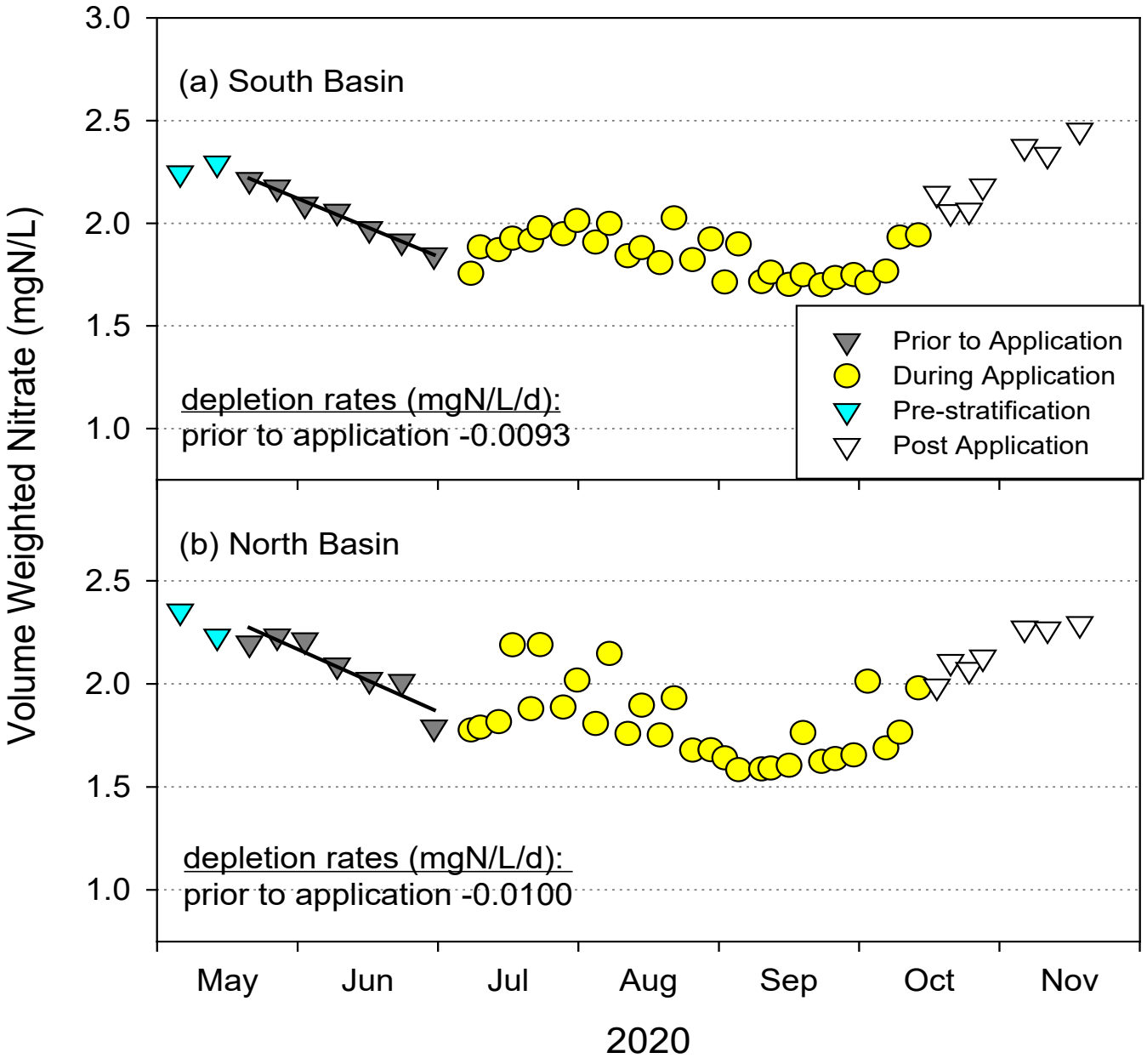
FIGURE 5.6

Honeywell

Onondaga Lake
Syracuse, New York

Hypolimnetic Nitrate Mass, Cumulative Mass of Nitrate Added, and Volume-Weighted Hypolimnetic Average Nitrate Concentration 2020.

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Note: Volume-weighted concentrations for the north and south basins were determined from field nitrate profiles and the respective water volumes of the basins.

FIGURE 5.7

Honeywell

Onondaga Lake
Syracuse, New York

Nitrate Depletion Rates in the Hypolimnion (10 to 19-Meter Water Depths) of Onondaga Lake in 2020: (a) South Basin and (b) North Basin

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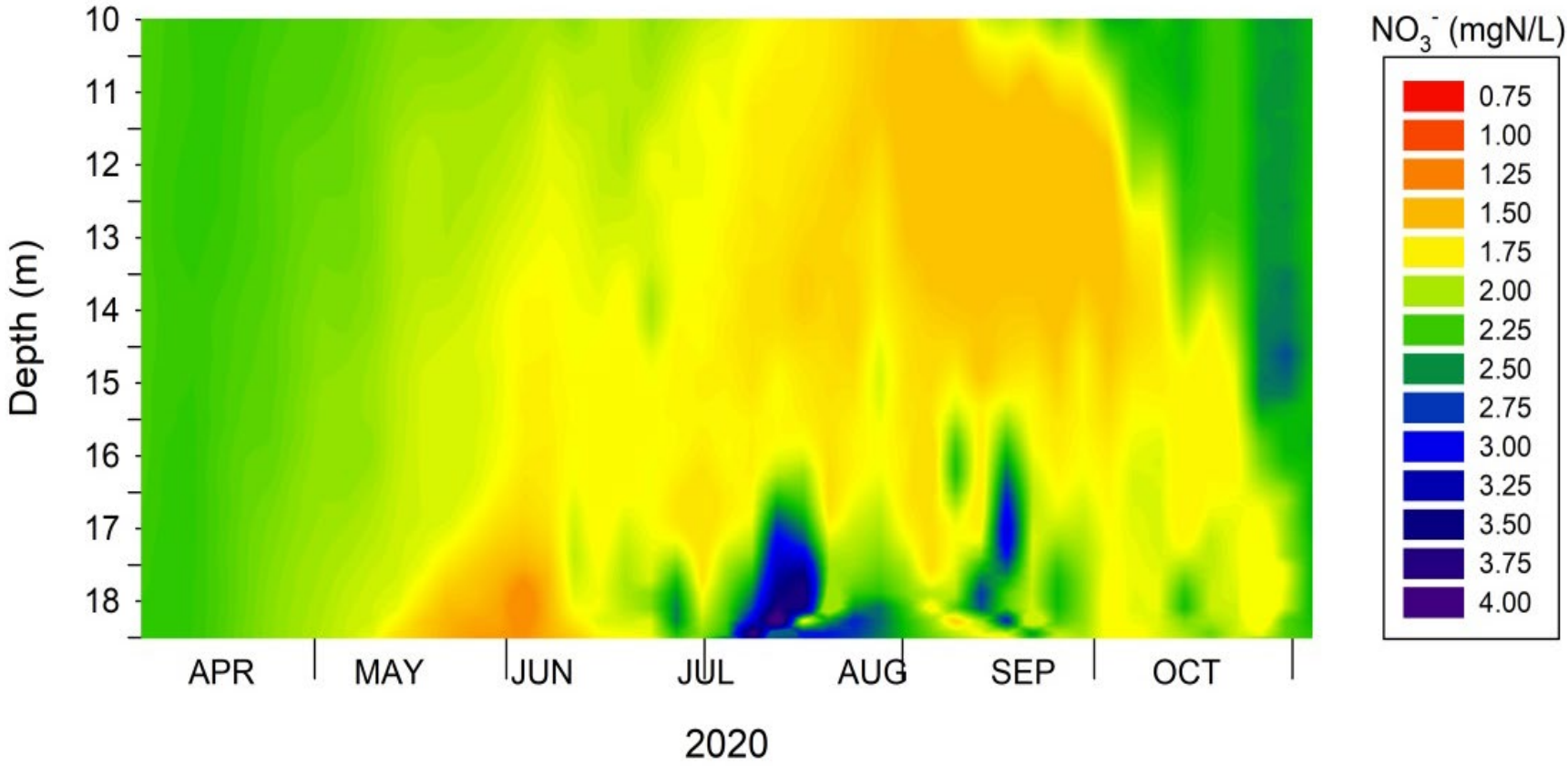


FIGURE 5.8

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Onondaga Lake
Syracuse, New York

Nitrate Concentrations in the Hypolimnion (10 meters to bottom) of Onondaga Lake (South Deep) in 2020

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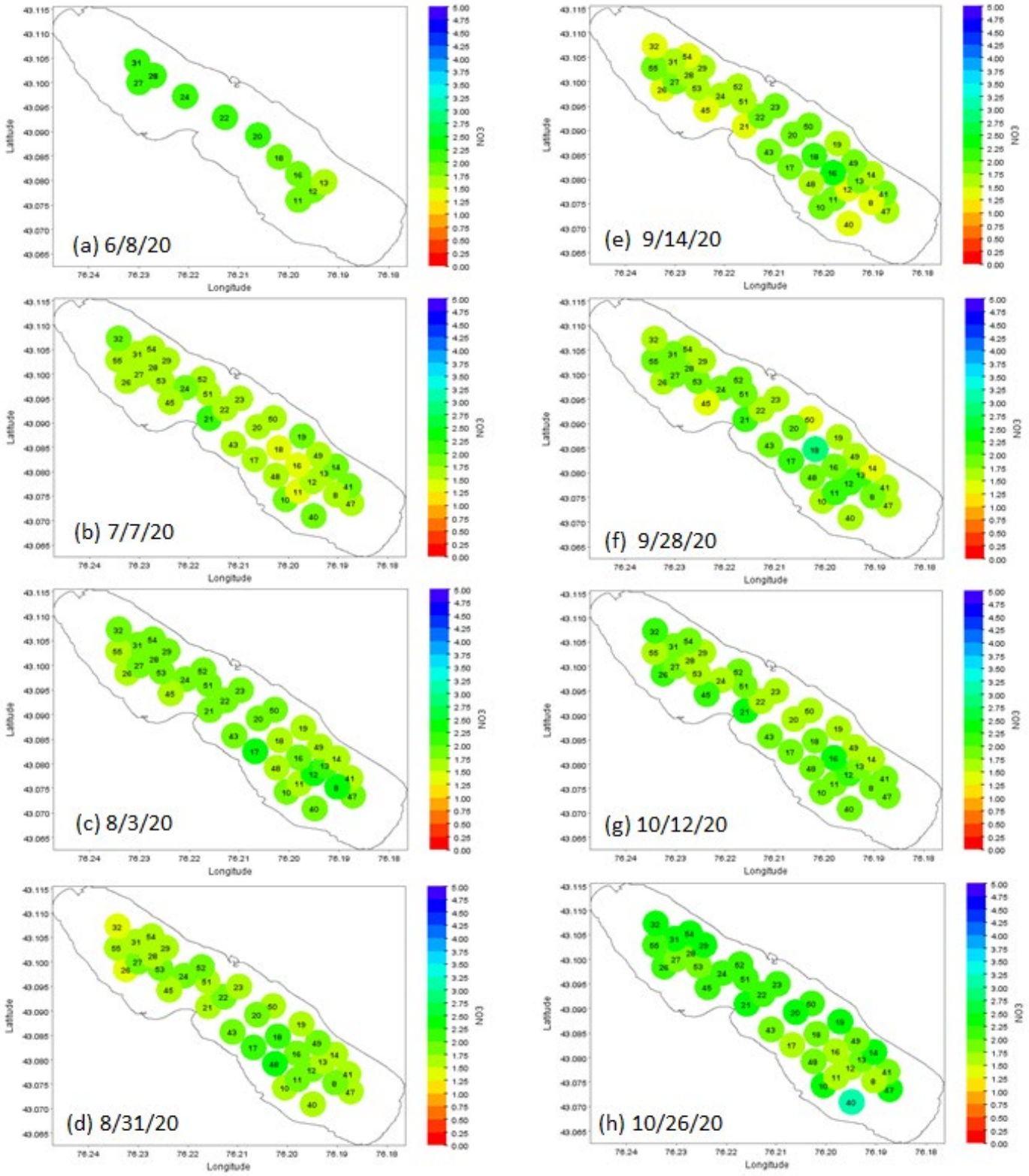


FIGURE 5.9

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Onondaga Lake
Syracuse, New York

Representative Plan-view Plots of Nitrate Concentrations (mgN/L) One Meter above the Lake Bottom for Onondaga Lake in 2020

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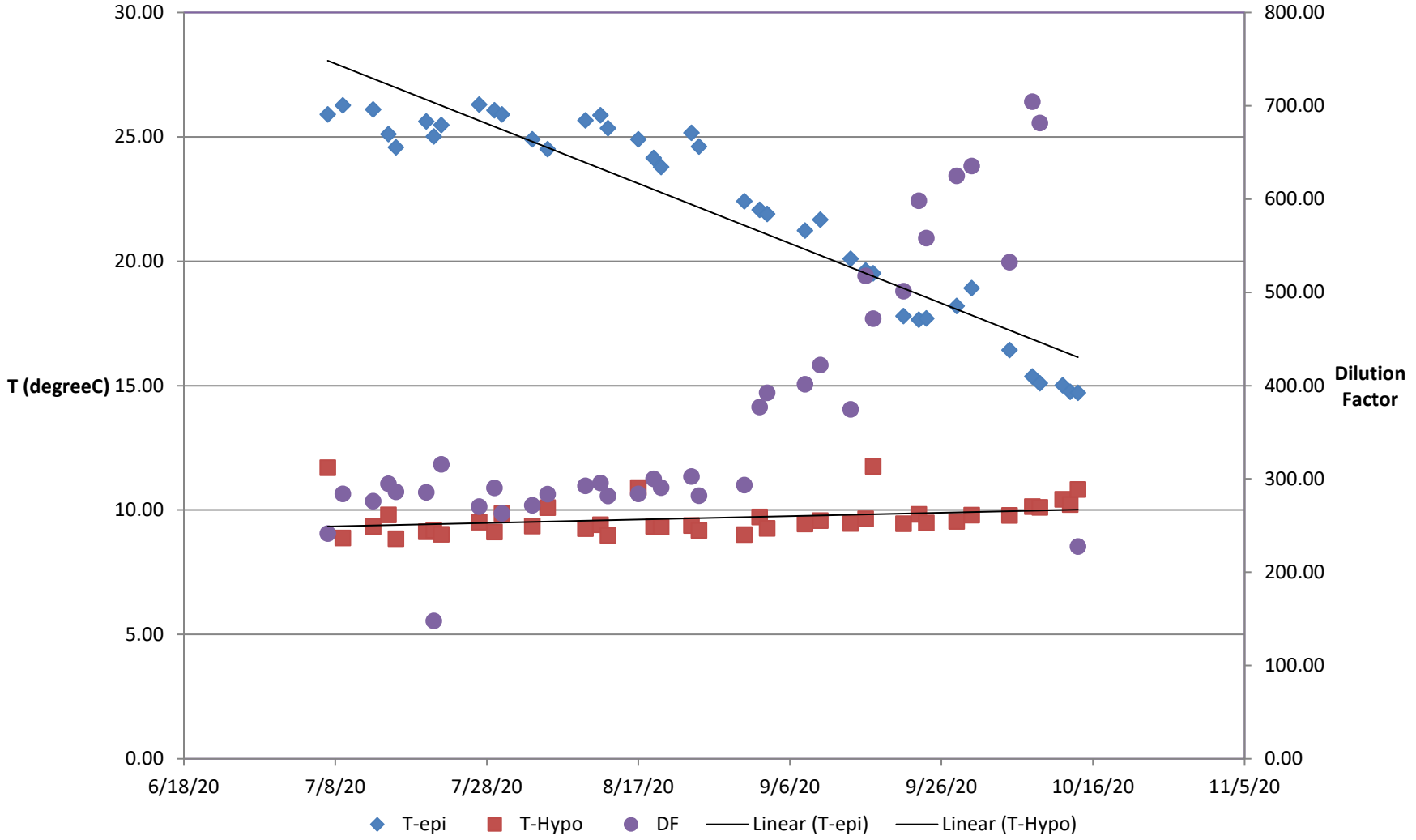


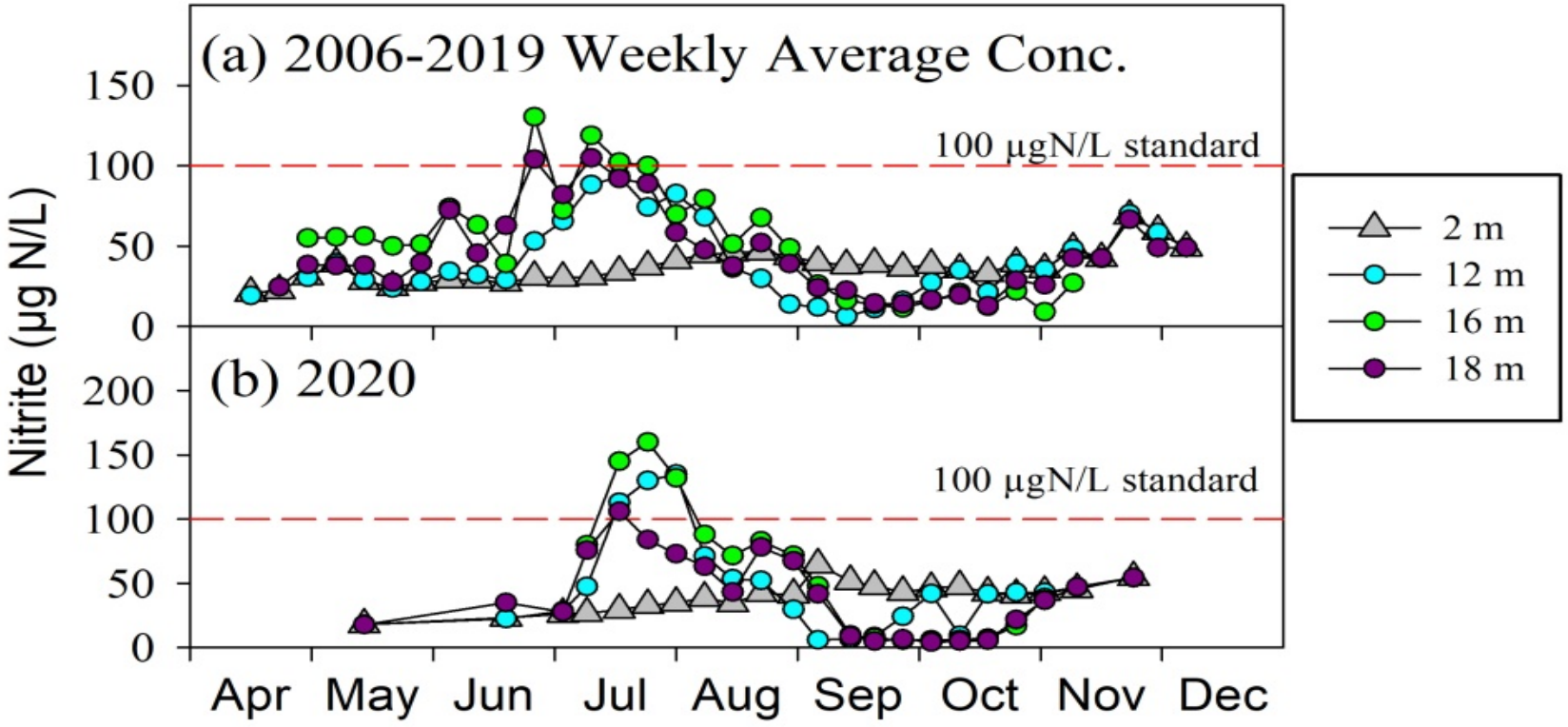
FIGURE 5.10

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Onondaga Lake
Syracuse, New York

2020 Epilimnion and Hypolimnion Temperatures and Dilution Factors

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a) weekly average concentration for 2006-2019 and (b) 2020 concentrations. Note: The ambient water quality standard for nitrite applicable to warm-water fisheries is 100 micrograms per liter (µgN/L) as nitrogen (red-dashed line)

FIGURE 5.11

Honeywell

Onondaga Lake
Syracuse, New York

Time Series of Nitrite-Nitrogen (NO2-N) for Onondaga Lake at South Deep for Four Water Depths

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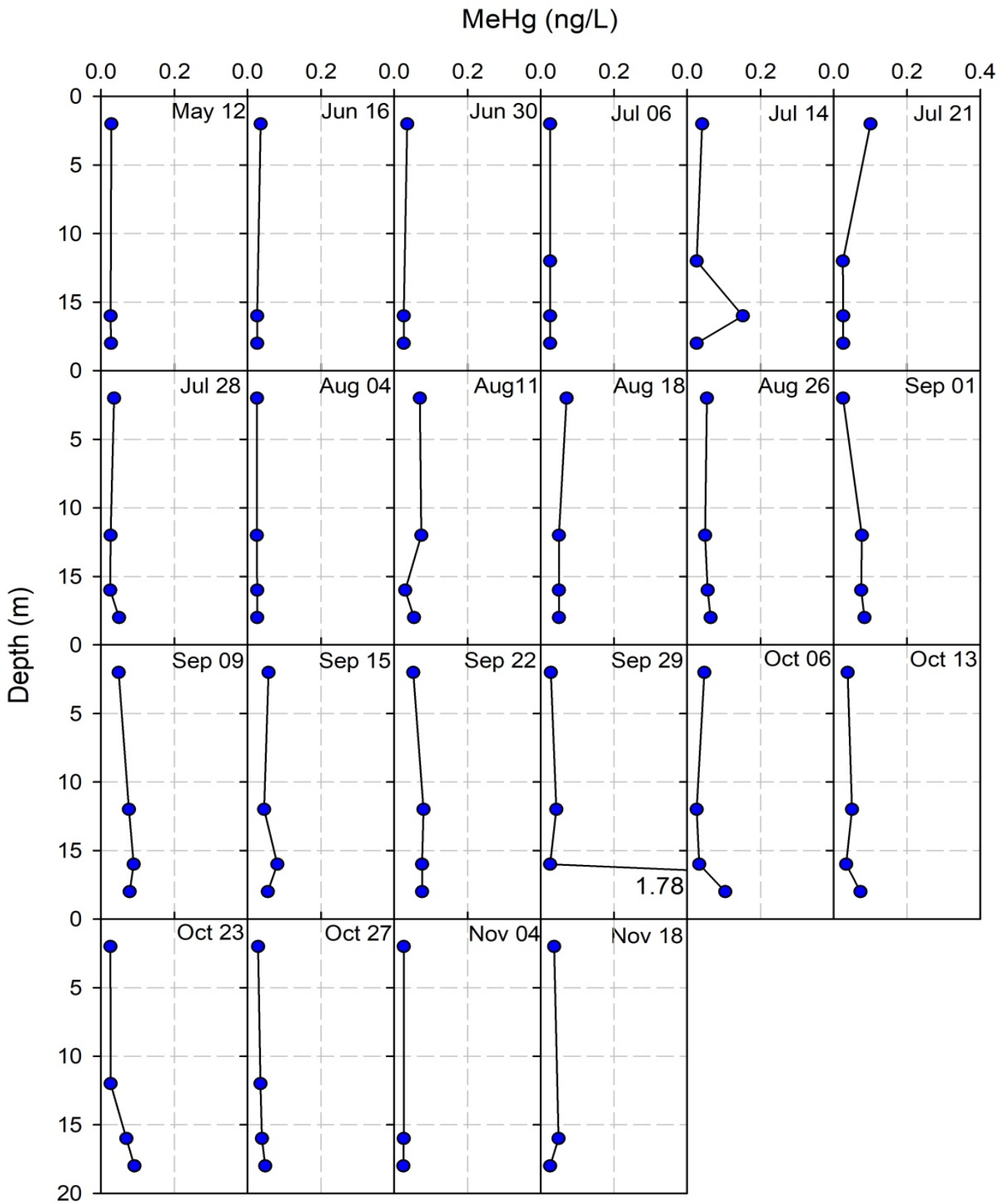


FIGURE 5.12

Honeywell

Onondaga Lake
Syracuse, New York

Vertical Profiles of Methylmercury (MeHg) Concentrations in Onondaga Lake Waters Measured at the South Deep Location: May 12 through November 18, 2020

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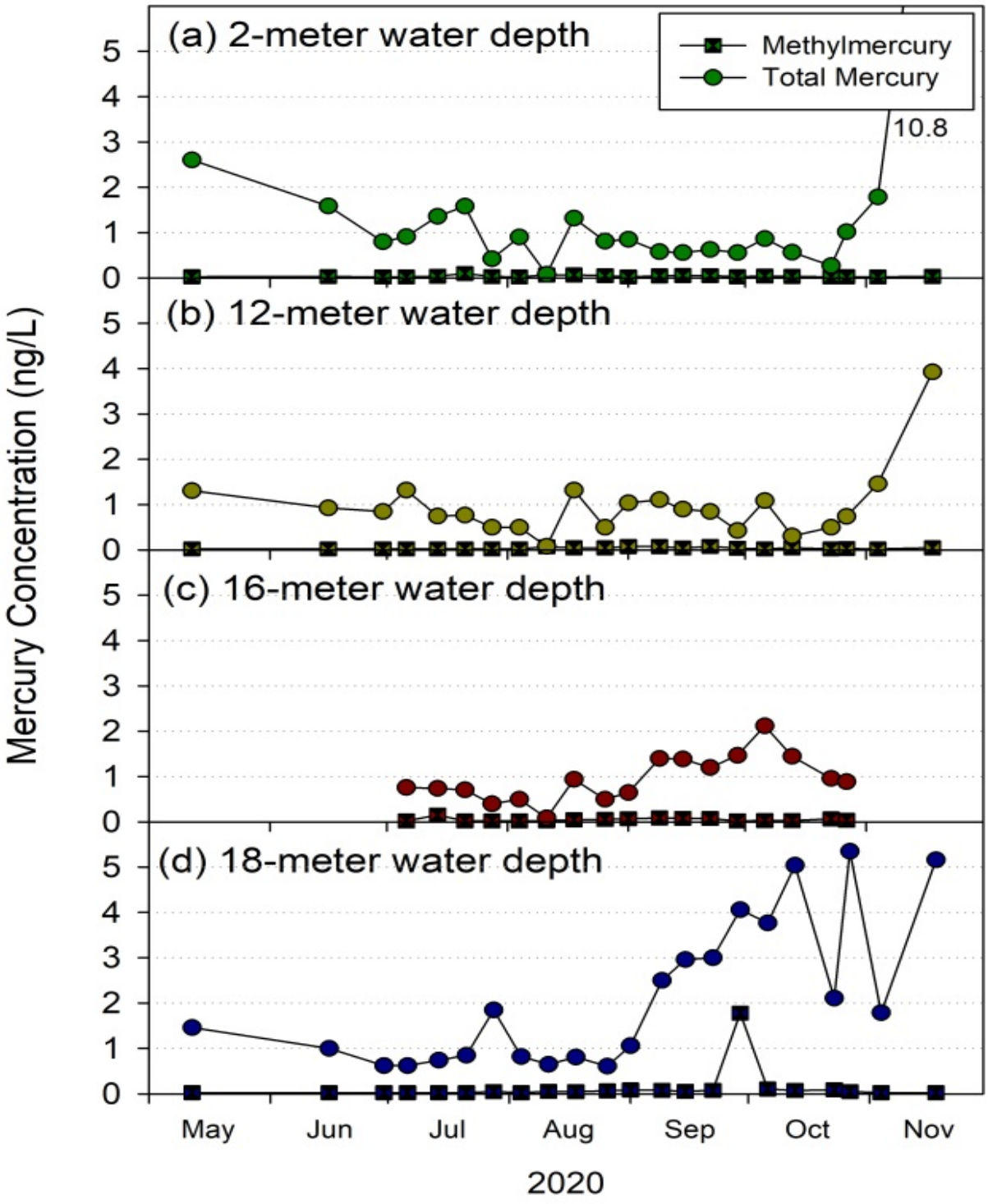


FIGURE 5.13

Honeywell

Onondaga Lake
Syracuse, New York

Total Mercury and Methylmercury Concentrations in Onondaga Lake at the South Deep Location in 2020: (a) 2, (b) 12, (c) 16, and (d) 18-Meter Water Depths.

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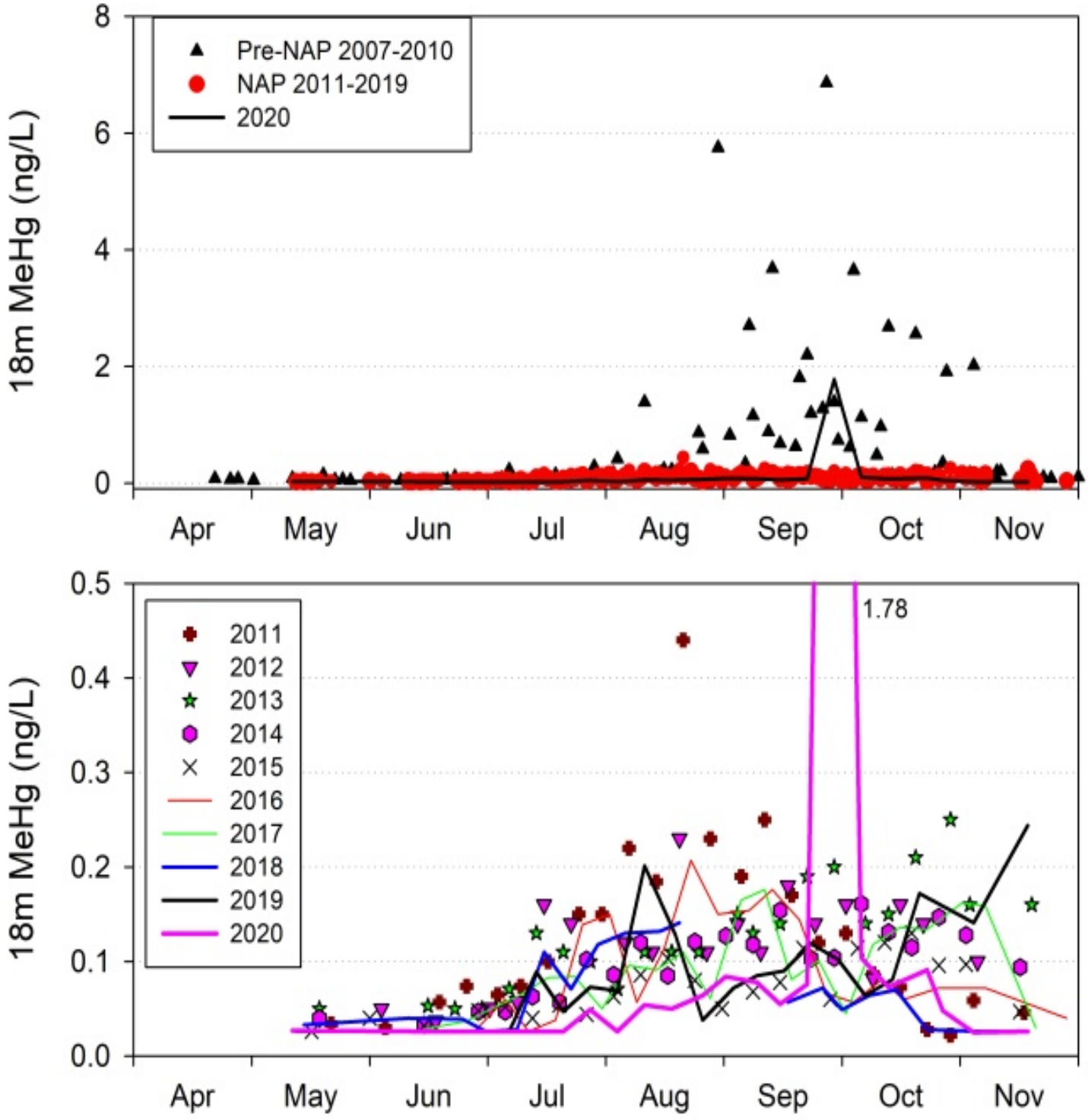


FIGURE 5.14

Honeywell

Onondaga Lake
Syracuse, New York

Time Series of Methylmercury Concentrations for the 18-meter Water Depth at the South Deep Location, 2007-2020. Bottom panel: 2011-2020 only.

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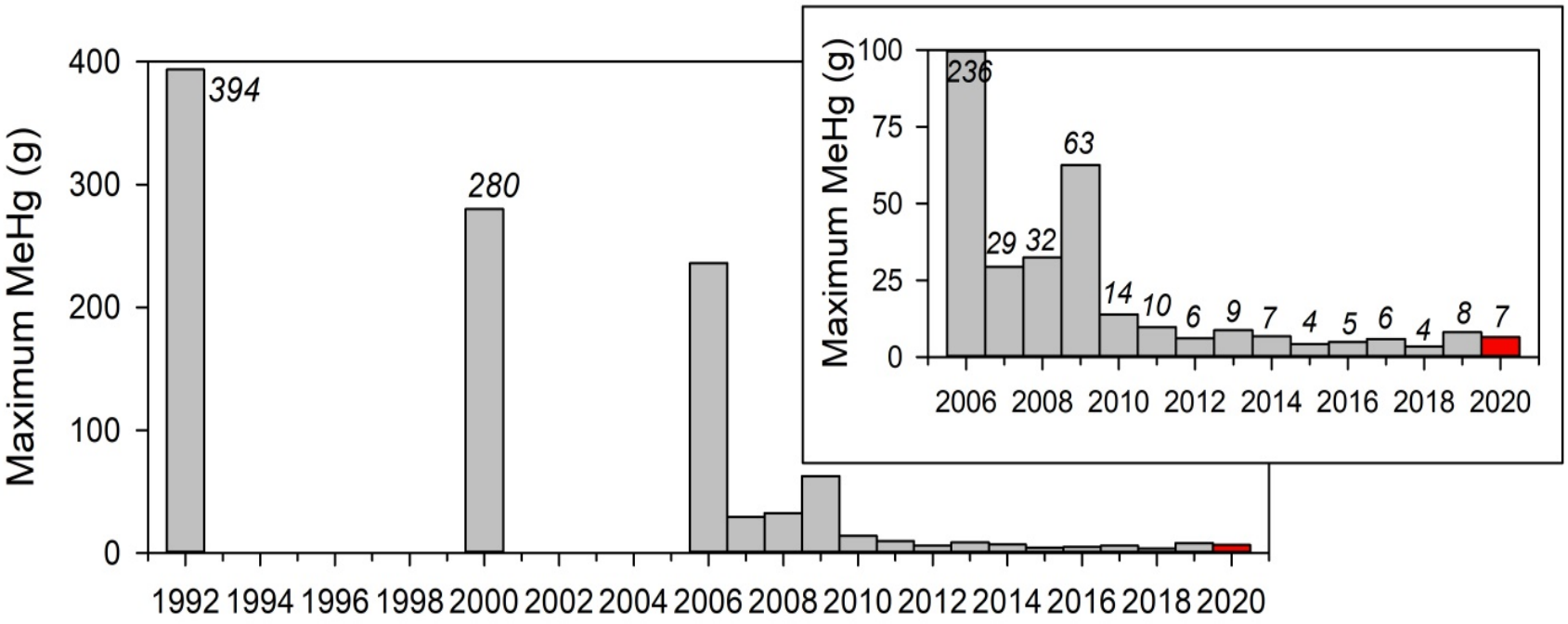


FIGURE 5.15

Honeywell

Onondaga Lake
Syracuse, New York

Annual Maximum Mass of Methylmercury in the Hypolimnion of Onondaga Lake from 1992 through 2020.

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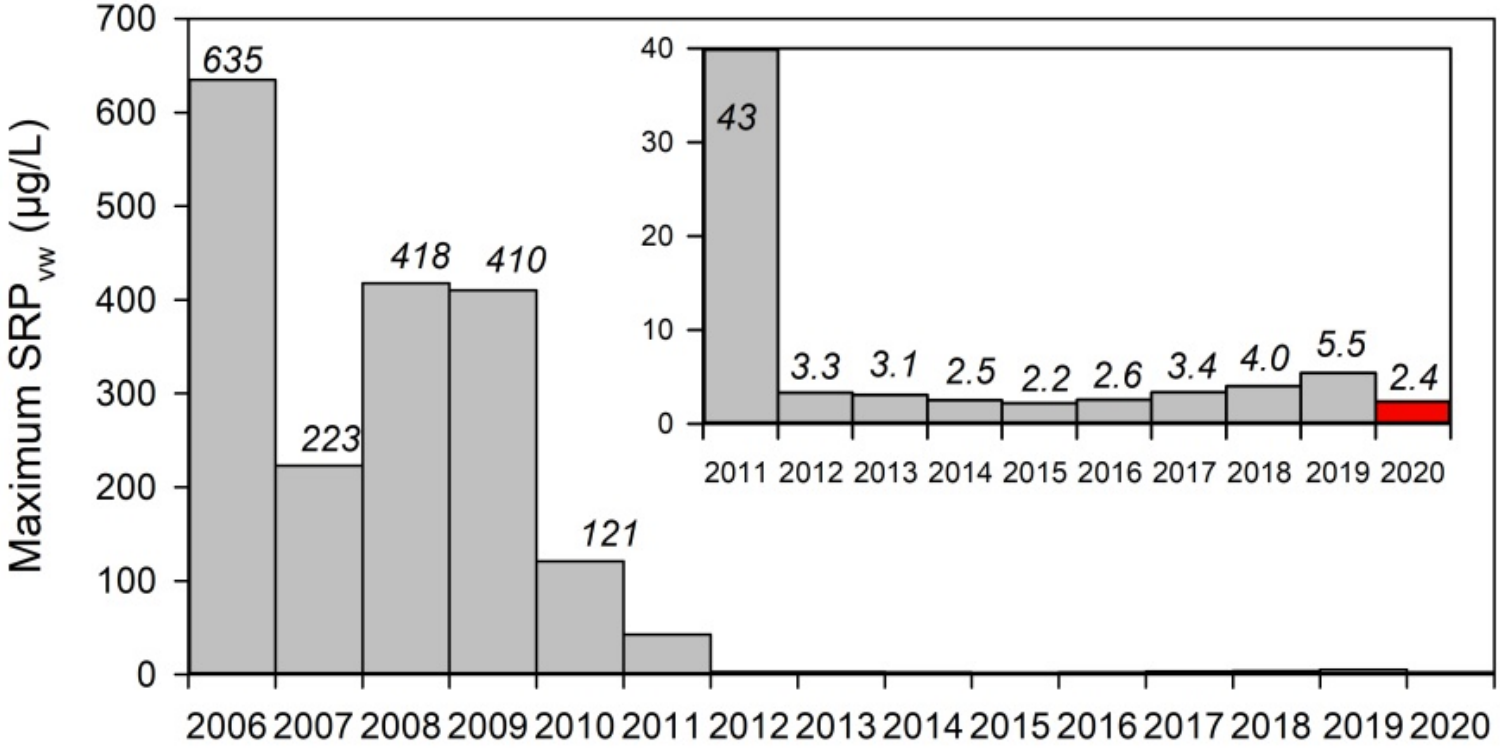


FIGURE 5.16

Honeywell

Onondaga Lake
Syracuse, New York

Annual Maximum Volume Weighted Concentrations of Soluble Reactive Phosphorus (SRP) in the Lower Hypolimnion of Onondaga Lake from 2006 through 2020

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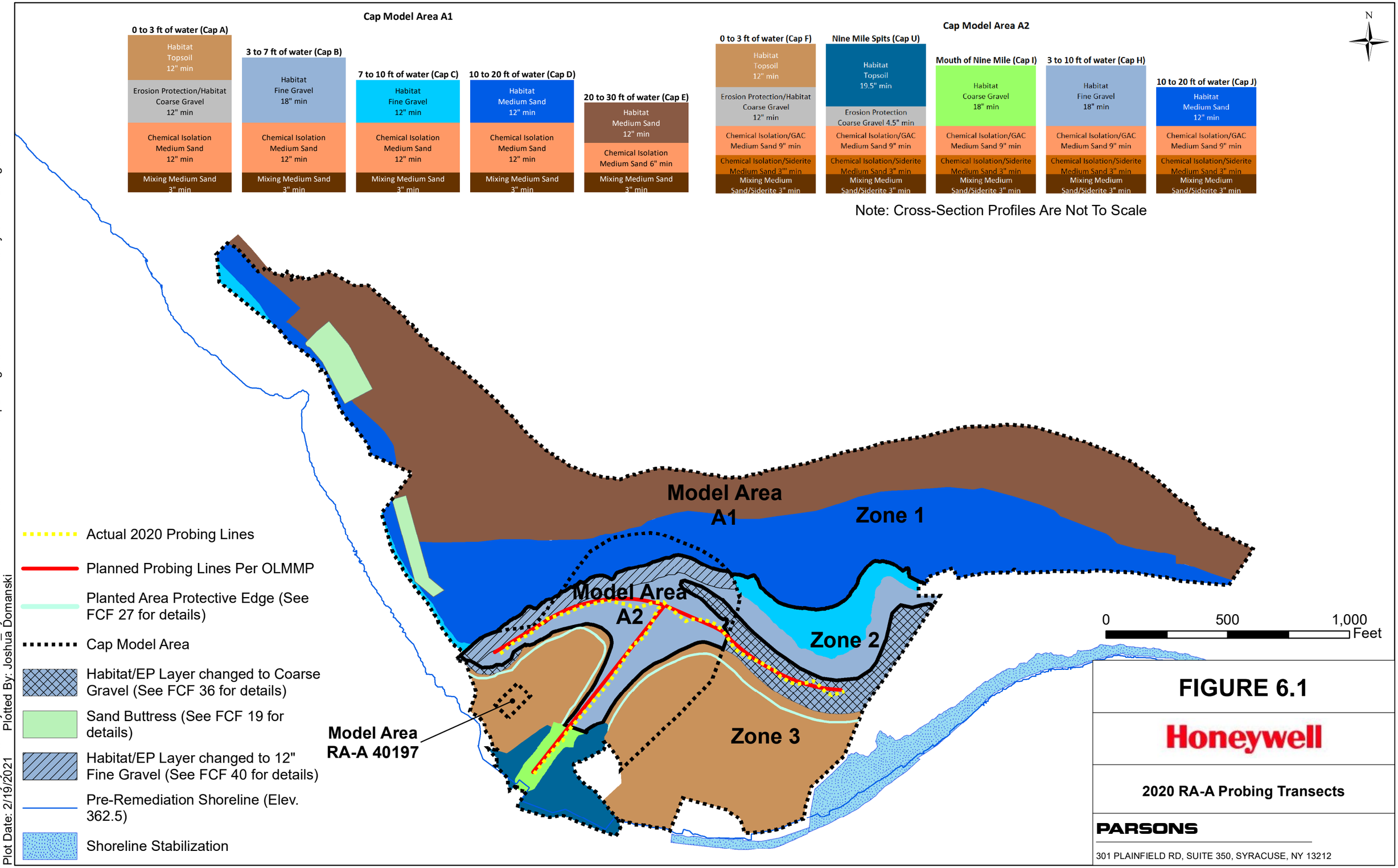


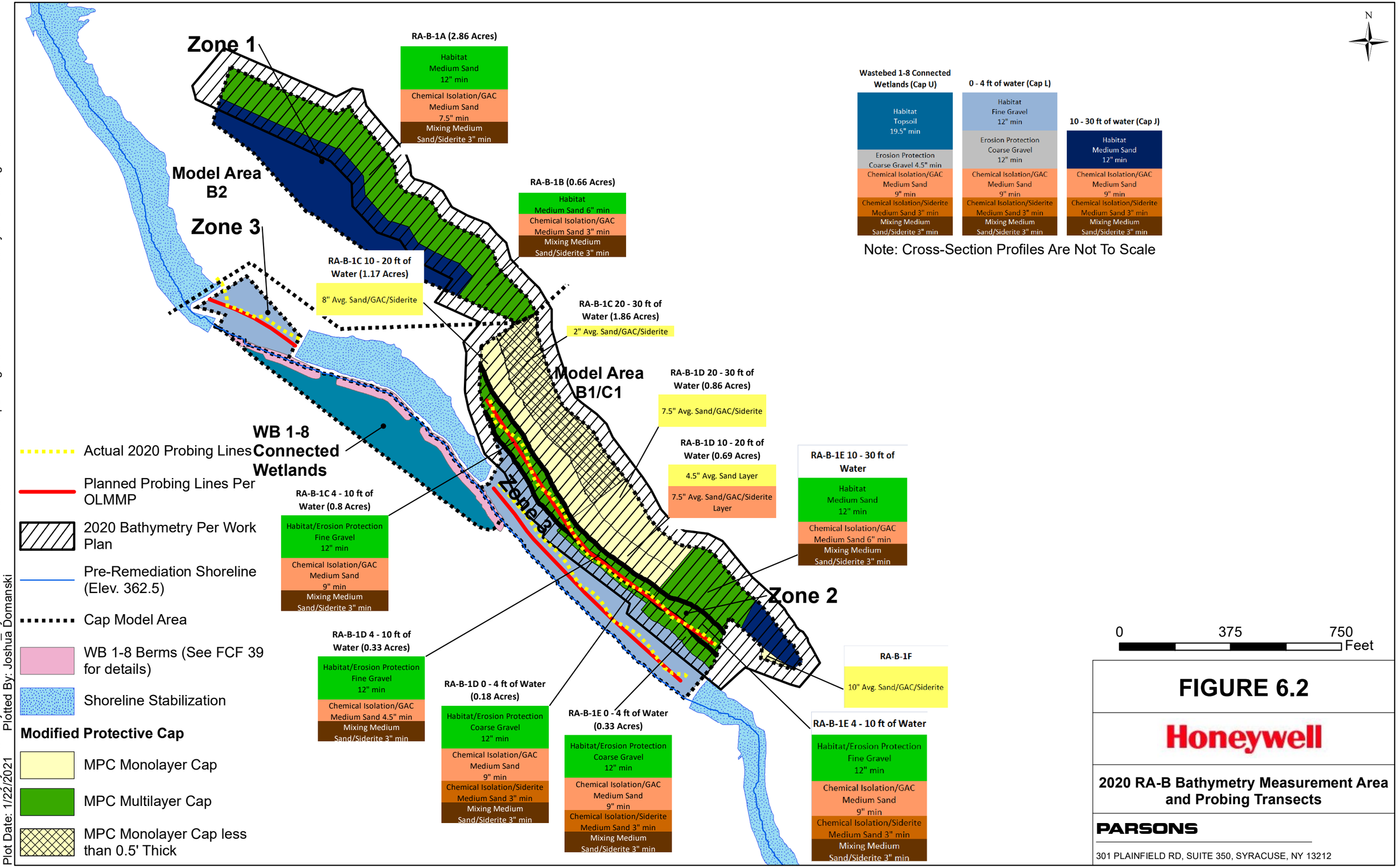
FIGURE 6.1

Honeywell

2020 RA-A Probing Transects

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File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\2020 OLMM Report\Figure 6.1 - 2020 RAA Bathy and Probing.mxd
Plot Date: 2/19/2021 Plotted By: Joshua Domanski



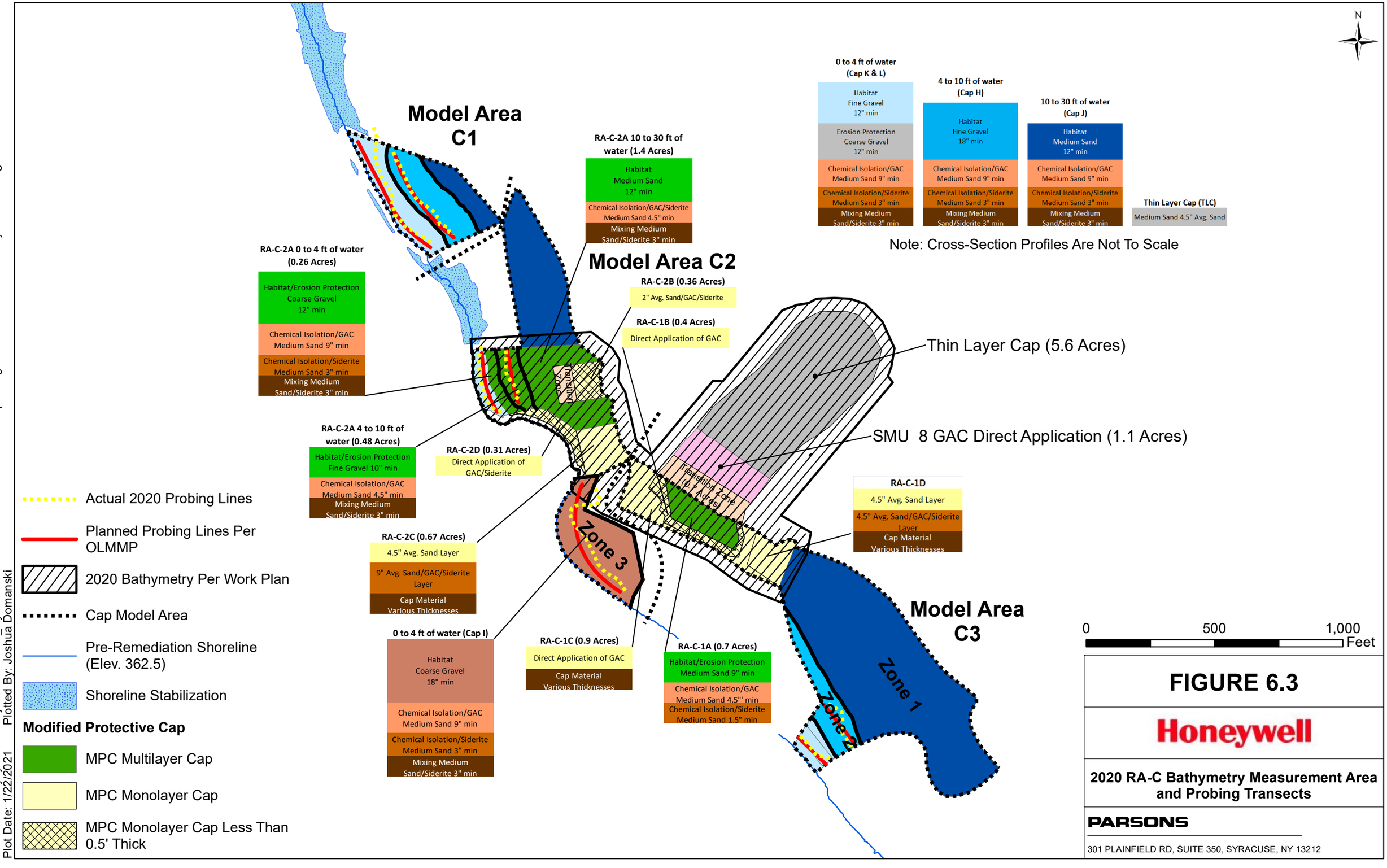
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Plot Date: 1/22/2021 Plotted By: Joshua Domanski

FIGURE 6.2

Honeywell

2020 RA-B Bathymetry Measurement Area and Probing Transects

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File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\2020 OLMM Report\Figure 6.3 - 2020 RAC Bathy and Probing.mxd
Plot Date: 1/22/2021 Plotted By: Joshua Domanski

FIGURE 6.3

Honeywell

2020 RA-C Bathymetry Measurement Area and Probing Transects

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N

Outboard West & Center (Cap U)
- Habitat Topsoil 19.5" min
- Erosion Protection Coarse Gravel 4.5" min
- Chemical Isolation/GAC Medium Sand 9" min
- Chemical Isolation/Siderite Medium Sand 3" min
- Mixing Medium Sand/Siderite 3" min

Outboard East (Cap T)
- Habitat Topsoil 19.5" min
- Erosion Protection Coarse Gravel 4.5" min
- Chemical Isolation/GAC Medium Sand 12" min
- Mixing Medium Sand/GAC 3" min

0 to 4 ft of water (Cap F & G)
- Habitat Medium Sand 12" min
- Erosion Protection/Habitat Coarse Gravel 12" min
- Chemical Isolation/GAC Medium Sand 9" min
- Chemical Isolation/Siderite Medium Sand 3" min
- Mixing Medium Sand/Siderite 3" min

4 to 7 ft of water (Cap H)
- Habitat Fine Gravel 18" min
- Chemical Isolation/GAC Medium Sand 9" min
- Chemical Isolation/Siderite Medium Sand 3" min
- Mixing Medium Sand/Siderite 3" min

7 to 10 ft of water (Cap M)
- Habitat Fine Gravel 12" min
- Chemical Isolation/GAC Medium Sand 9" min
- Chemical Isolation/Siderite Medium Sand 3" min
- Mixing Medium Sand/Siderite 3" min

10 to 30 ft of water (Cap J)
- Habitat Medium Sand 12" min
- Chemical Isolation/GAC Medium Sand 9" min
- Chemical Isolation/Siderite Medium Sand 3" min
- Mixing Medium Sand/Siderite 3" min

Thin Layer Cap (TLC)
- Medium Sand 2" min

Amended TLC
- Sand/GAC Layer 4.5" Avg.

Note: Cross-Section Profiles Are Not To Scale

Model Area D-SMU-2

1 Extra Foot of Sand Placed Over Former Water Inlet Pipe Valve Structure

RA-D-1B (1.17 Acres)
- 4.5" Avg. Sand/GAC/Siderite

RA-D-1A (7.55 Acres)
- Habitat Medium Sand 12" min
- Chemical Isolation/GAC Medium Sand 6" min
- Mixing Medium Sand/Siderite 3" min

RA-D-2 (2.4 Acres)
- Habitat Medium Sand 10.5" min
- Chemical Isolation/GAC Medium Sand 4.5" min
- Chemical Isolation/Siderite Medium Sand 3" min
- Mixing Medium Sand/Siderite 3" min

Amended TLC Area B (9.3 Acres)

Amended TLC Area A (7.5 Acres)

RA-D-1A

RA-D-1B

Addendum East

Model Area D-West

Model Area D-Center

Model Area D-East

Zone 1

Zone 2

Zone 3

Model Area OL-VC-10138/40

Model Area Outboard West

Model Area Outboard Center

Model Area Outboard East

2020 Bathymetry Per Work Plan

- Cobble Armoring w/Topsoil on 5H:1V Slope Adjacent to Barrier Wall (See FCF 62 for details)
- West Naturalized Shoreline (See FCF 57 for details)
- East Naturalized Shoreline (See FCF 58 for details)
- Berms (See FCF 62 for details)
- 25 ft Zone of Topsoil Habitat
- Plateau Armored Edge (See FCF 62 for details)
- Marine Mattress and Adjacent Sand Buttress (See FCF 63 for details)
- Actual 2020 Probing Lines
- Planned Probing Lines Per OLMMP
- Harbor Brook Channel
- Pre-Remediation Shoreline (Elev. 362.5)
- Cap Model Area

Modified Protective Cap
- MPC Monolayer Cap Less Than 0.5' Thick
- MPC Multilayer Cap

0 500 1,000 Feet

FIGURE 6.4

Honeywell

2020 RA-D Bathymetry Measurement Area and Probing Transects

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Plot Date: 1/25/2021 Plotted By: Joshua Domanski

Cap Model Area E1

0 to 3 ft of Water (Cap N)
- Habitat Coarse Gravel 12" min
- Erosion Protection Gravelly Cobble 12" min
- Chemical Isolation Gravelly Sand 12" min
- Mixing Gravelly Sand 3"

2 to 7 ft of Water (Cap O)
- Erosion Protection/Habitat Gravelly Cobble 18" min
- Chemical Isolation Gravelly Sand 12" min
- Mixing Gravelly Sand 3"

7 to 10 ft of Water (Cap P)
- Erosion Protection/Habitat Coarse Gravel 12" min
- Chemical Isolation Medium Sand 12" min
- Mixing Medium Sand 3"

10 to 20 ft of Water (Cap C)
- Erosion Protection/Habitat Fine Gravel 12" min
- Chemical Isolation Medium Sand 12" min
- Mixing Medium Sand 3"

20 to 30 ft of water (Cap E)
- Habitat Medium Sand 12" min
- Chemical Isolation Medium Sand 6" min
- Mixing Medium Sand 3"

CRs & Nav Channel (Cap Q)
- Erosion Protection/Habitat Gravelly Cobble 12" min
- Chemical Isolation Gravelly Sand 12" min
- Mixing Gravelly Sand 3"

MERC
- Gravelly Sand/GAC 6" Avg.

Thin Layer Cap (TLC)
- Medium Sand 2" min

Cap Model Areas E2 & E3

0 to 3 ft of Water (Cap NN)
- Habitat Coarse Gravel 12" min
- Erosion Protection Gravelly Cobble 12" min
- Chemical Isolation/GAC Gravelly Sand 12" min
- Mixing Gravelly Sand/GAC 3"

3 to 7 ft of Water (Cap OO)
- Erosion Protection/Habitat Gravelly Cobble 18" min
- Chemical Isolation/GAC Gravelly Sand 12" min
- Mixing Gravelly Sand/GAC 3"

7 to 10 ft of Water (Cap PP)
- Erosion Protection/Habitat Coarse Gravel 12" min
- Chemical Isolation/GAC Medium Sand 12" min
- Mixing Medium Sand/GAC 3"

10 to 20 ft of Water (Cap CC)
- Erosion Protection/Habitat Fine Gravel 12" min
- Chemical Isolation/GAC Medium Sand 12" min
- Mixing Medium Sand/GAC 3"

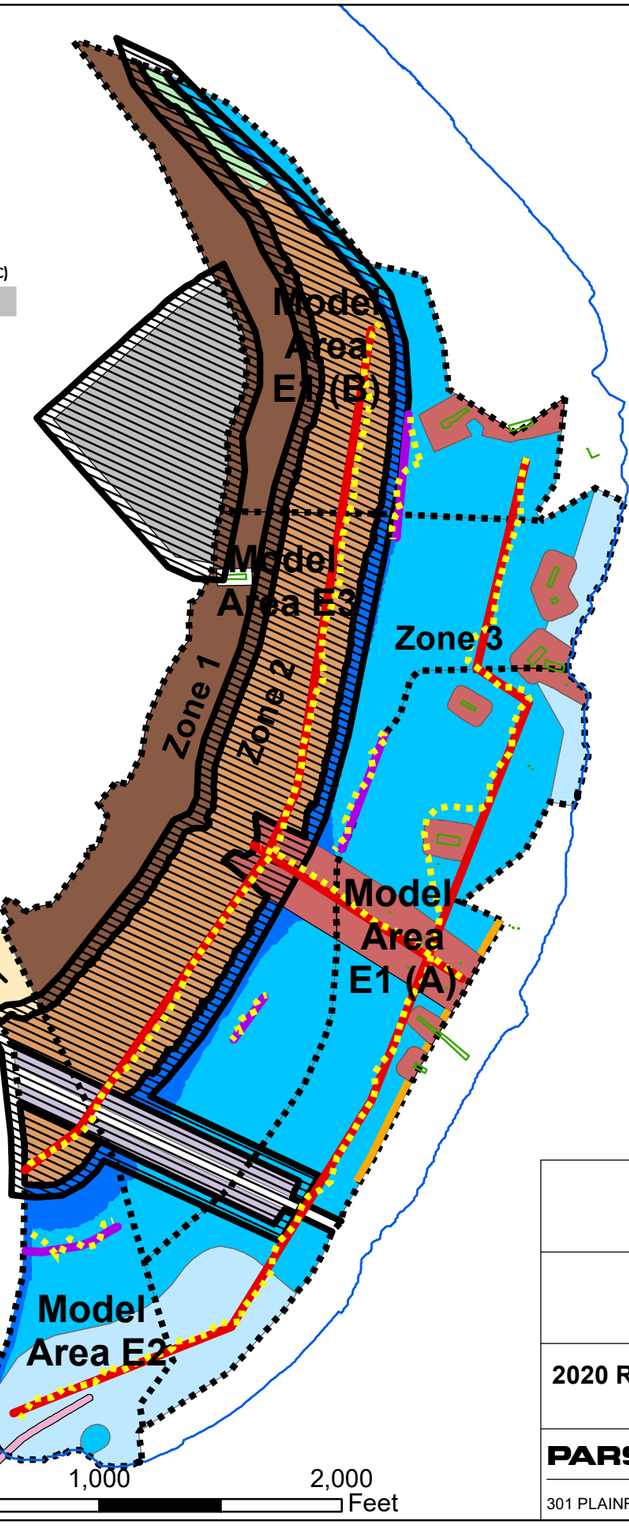
20 to 30 ft of water (Cap S)
- Habitat Medium Sand 12" min
- Chemical Isolation/GAC Medium Sand 6" min
- Mixing Medium Sand/GAC 3"

CRs & Nav Channel (Cap QQ)
- Erosion Protection/Habitat Gravelly Cobble 12" min
- Chemical Isolation/GAC Gravelly Sand 12" min
- Mixing Gravelly Sand/GAC 3"

MERC
- Gravelly Sand/GAC 6" Avg.

Note: Cross-Section Profiles Are Not To Scale

20 to 30 ft of water (Cap R)
- Habitat Medium Sand 12" min
- Chemical Isolation/GAC Medium Sand 12" min
- Mixing Medium Sand/GAC 3"



- Actual 2020 Probing Lines
- Planned Probing Lines Per OLMMP
- Planned Supplemental Probing Lines as Recommended in the 2018 and 2019 Annual Report
- 2020 Bathymetry Per Work Plan
- Cultural Resources
- Wave Dampers
- Pre-Remediation Shoreline (Elev. 362.5)
- Cap Model
- Berms (See FCF 62 for details)
- Sand Buttress (See FCF 48 for details)

FIGURE 6.5

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2020 RA-E Bathymetry Measurement Area and Probing Transects

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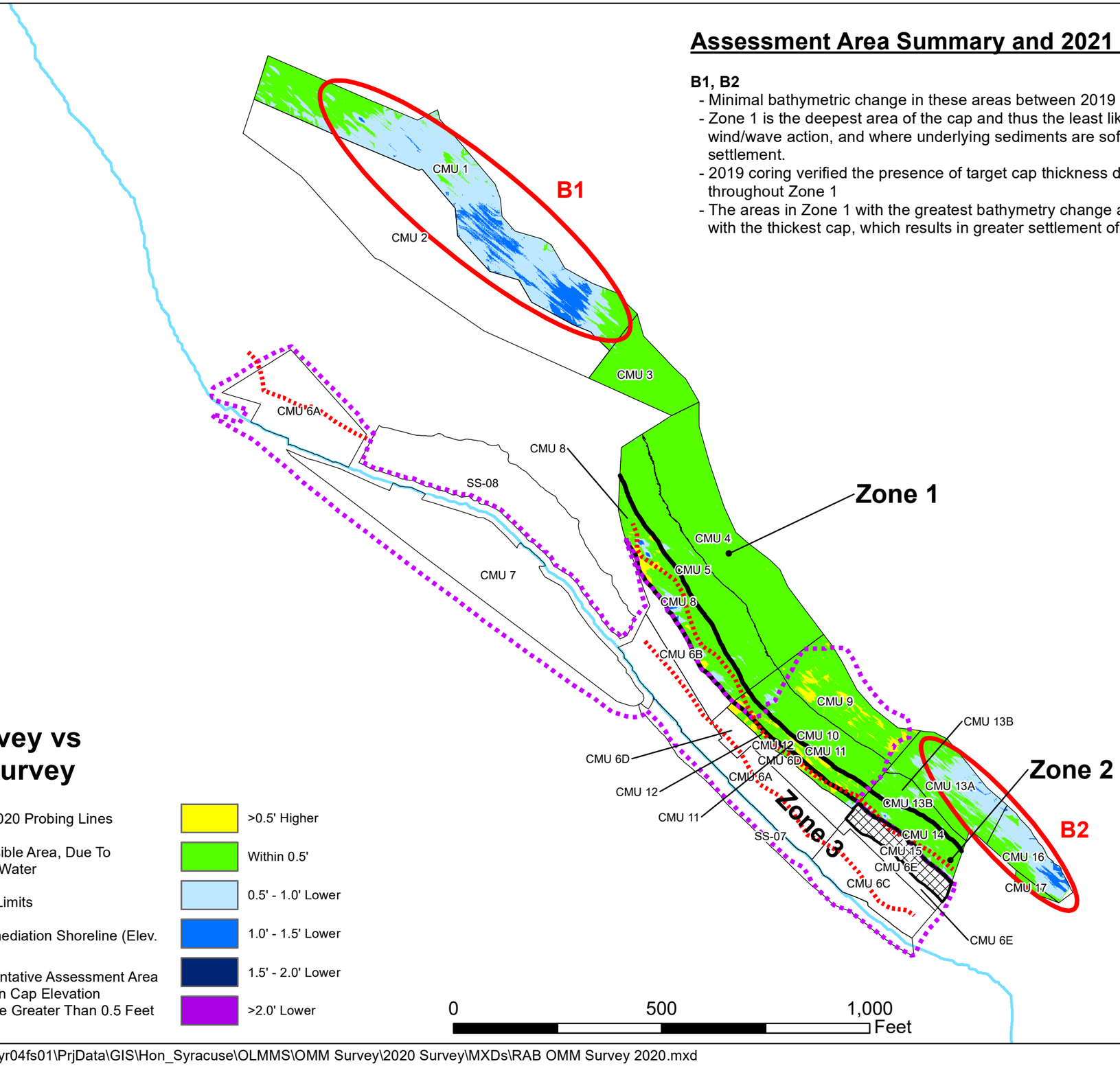
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Plot Date: 1/22/2021 Plotted By: Sisson, Evan

Assessment Area Summary and 2021 Recommendations

B1, B2

- Minimal bathymetric change in these areas between 2019 and 2020.
- Zone 1 is the deepest area of the cap and thus the least likely to be impacted by wind/wave action, and where underlying sediments are softest and most prone to settlement.
- 2019 coring verified the presence of target cap thickness defined in the OLMMP throughout Zone 1
- The areas in Zone 1 with the greatest bathymetry change are generally the areas with the thickest cap, which results in greater settlement of the underlying sediments.



2020 Survey vs Asbuilt Survey

- Actual 2020 Probing Lines
- Inaccessible Area, Due To Shallow Water
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)
- B2 Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

Plotted By: Domanski, Joshua

Plot Date: 2/19/2021

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2020 Survey\MXDs\RAB OMM Survey 2020.mxd

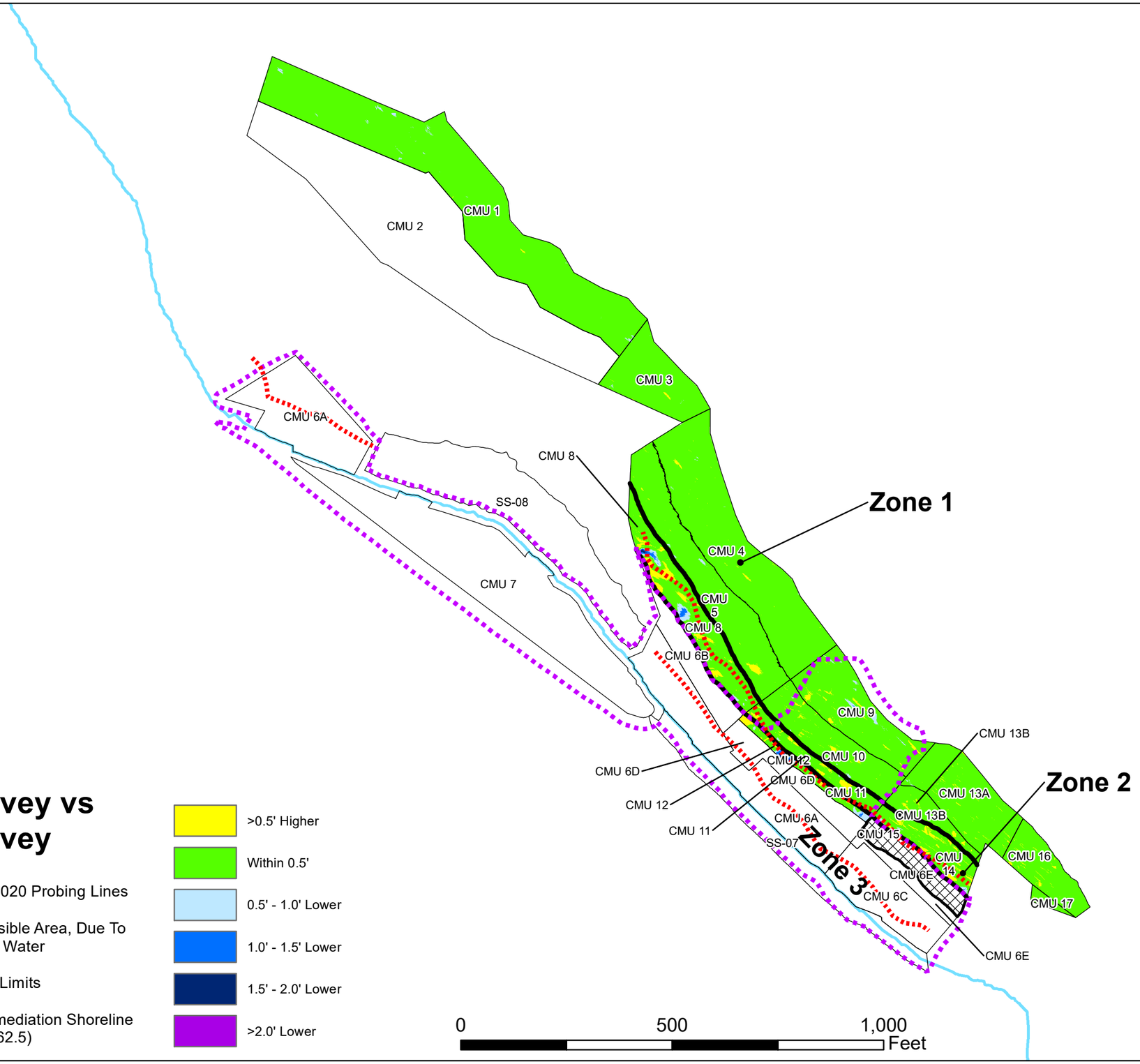
Figure 6.6

Honeywell

RA-B 2020 vs Asbuilt Bathymetric Survey

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301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212



2020 Survey vs 2019 Survey

- Actual 2020 Probing Lines
- Inaccessible Area, Due To Shallow Water
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

Figure 6.7

Honeywell

RA-B 2020 vs 2019 Bathymetric Survey

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Plotted By: Domanski, Joshua

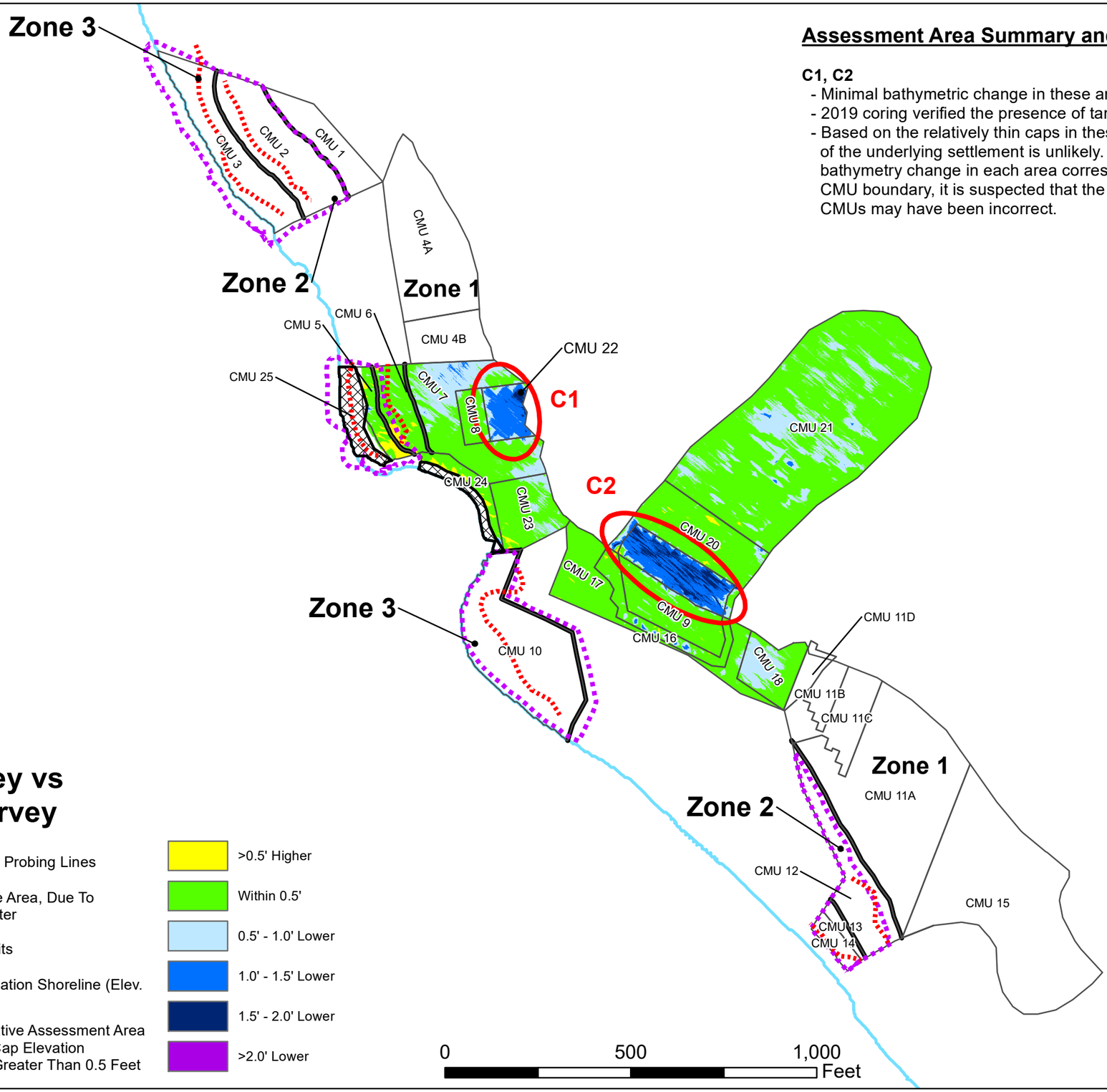
Plot Date: 1/27/2021

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2020 Survey\MXDs\RAB OMM Survey 2019 v 2020.mxd

Assessment Area Summary and 2021 Recommendations

C1, C2

- Minimal bathymetric change in these areas between 2019 and 2020.
- 2019 coring verified the presence of target cap thickness in these areas.
- Based on the relatively thin caps in these areas, significant settlement of the underlying settlement is unlikely. Given the area of significant bathymetry change in each area corresponds almost exactly with the CMU boundary, it is suspected that the as-built survey for these two CMUs may have been incorrect.



2020 Survey vs Asbuilt Survey

- Actual 2020 Probing Lines
- Inaccessible Area, Due To Shallow Water
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)
- C2 — Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

Plotted By: Domanski, Joshua

Plot Date: 2/19/2021

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2020 Survey\MXDs\RAC OMM Survey 2020.mxd

Figure 6.8

Honeywell

RA-C 2020 vs Asbuilt Bathymetric Survey

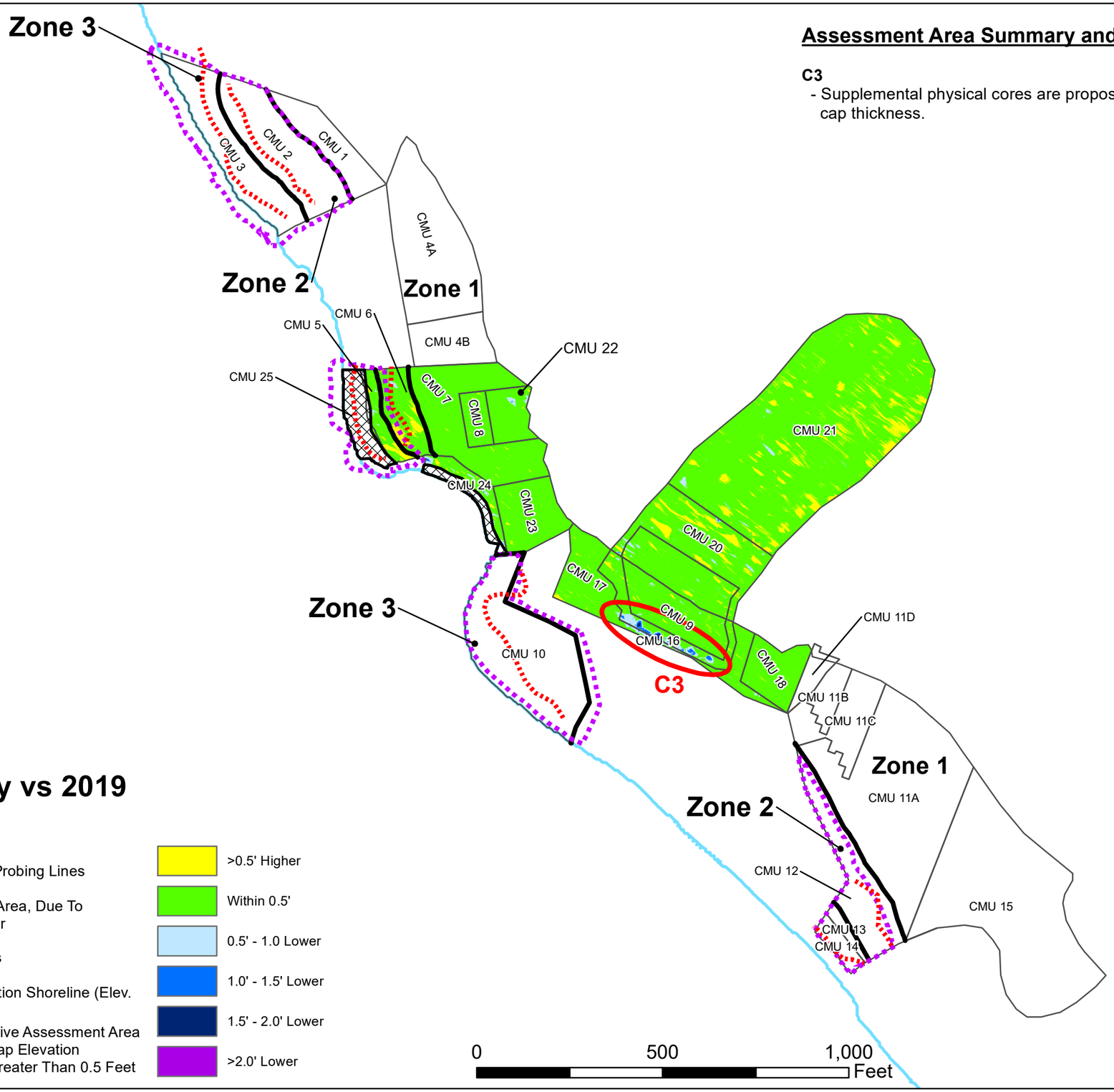
PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Assessment Area Summary and 2021 Recommendations

C3

- Supplemental physical cores are proposed for 2021 in this area to verify the cap thickness.



2020 Survey vs 2019 Survey

- Actual 2020 Probing Lines
- Inaccessible Area, Due To Shallow Water
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)
- C2 — Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0 Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

Figure 6.9

Honeywell

RA-C 2020 vs 2019 Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Domanski, Joshua

Plot Date: 6/7/2021

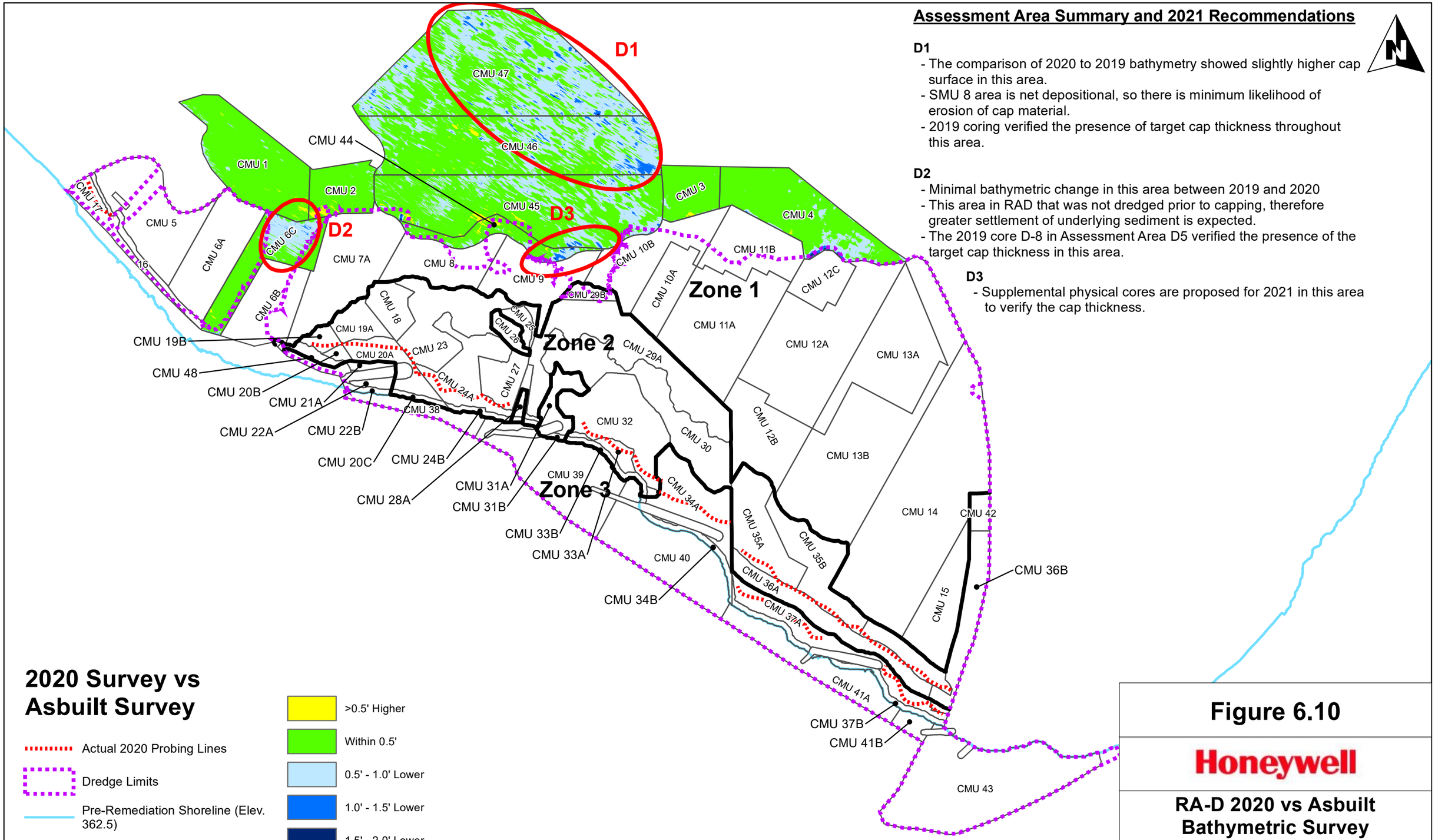
Document Path: Q:\GIS\Hon_Syracuse\OLMMS\OMM Survey\2020 Survey\MXDs\RAC OMM Survey 2019 v 2020C.mxd

Assessment Area Summary and 2021 Recommendations

D1
- The comparison of 2020 to 2019 bathymetry showed slightly higher cap surface in this area.
- SMU 8 area is net depositional, so there is minimum likelihood of erosion of cap material.
- 2019 coring verified the presence of target cap thickness throughout this area.

D2
- Minimal bathymetric change in this area between 2019 and 2020
- This area in RAD that was not dredged prior to capping, therefore greater settlement of underlying sediment is expected.
- The 2019 core D-8 in Assessment Area D5 verified the presence of the target cap thickness in this area.

D3
- Supplemental physical cores are proposed for 2021 in this area to verify the cap thickness.



2020 Survey vs Asbuilt Survey

- Actual 2020 Probing Lines
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)
- D2 — Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

0 750 1,500 Feet

Figure 6.10

Honeywell

RA-D 2020 vs Asbuilt Bathymetric Survey

PARSONS
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Domanski, Joshua

Plot Date: 6/7/2021

Document Path: Q:\GIS\Hon_Syracuse\OLMMS\OMM Survey\2020 Survey\MXDs\RAD OMM Survey 2020B.mxd

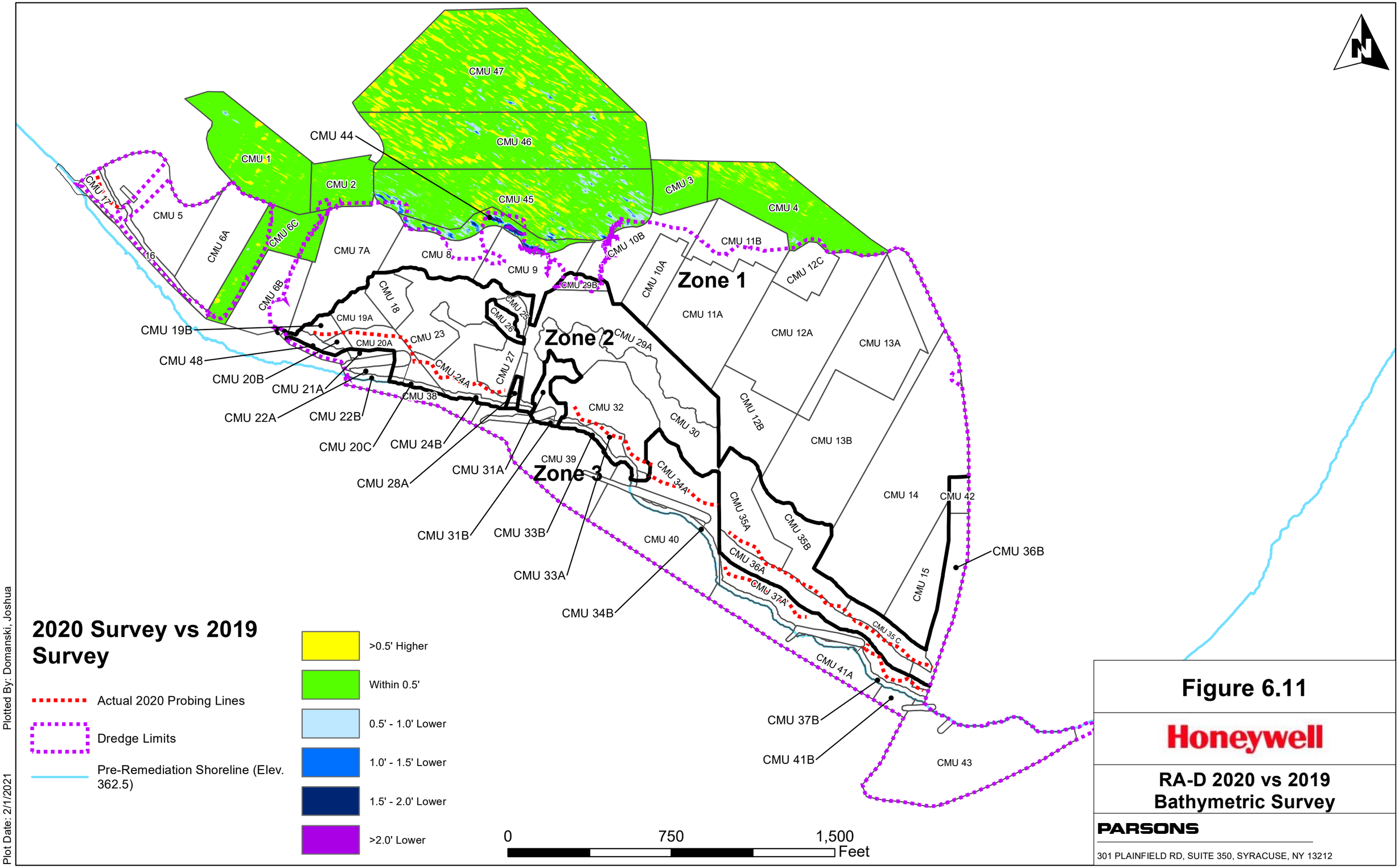


Figure 6.11

Honeywell

RA-D 2020 vs 2019 Bathymetric Survey

PARSONS
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Domanski, Joshua

Plot Date: 2/1/2021

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2020 Survey\MXDs\RAD OMM Survey 2019 v 2020.mxd

Assessment Area Summary and 2021 Recommendations

Zone 2

- Minimal change in bathymetry between 2019 and 2020.
- 2019 cores in southern half verified the presence of target cap thickness.
- EP substrate was present in all 2019 cores in the northern half. However, the EP layer and/or the total cap thickness measured was less than the target thickness in some cores in the northern half.
- Supplemental physical cores and videoprobing are recommended in this area in 2021 to verify cap thicknesses.

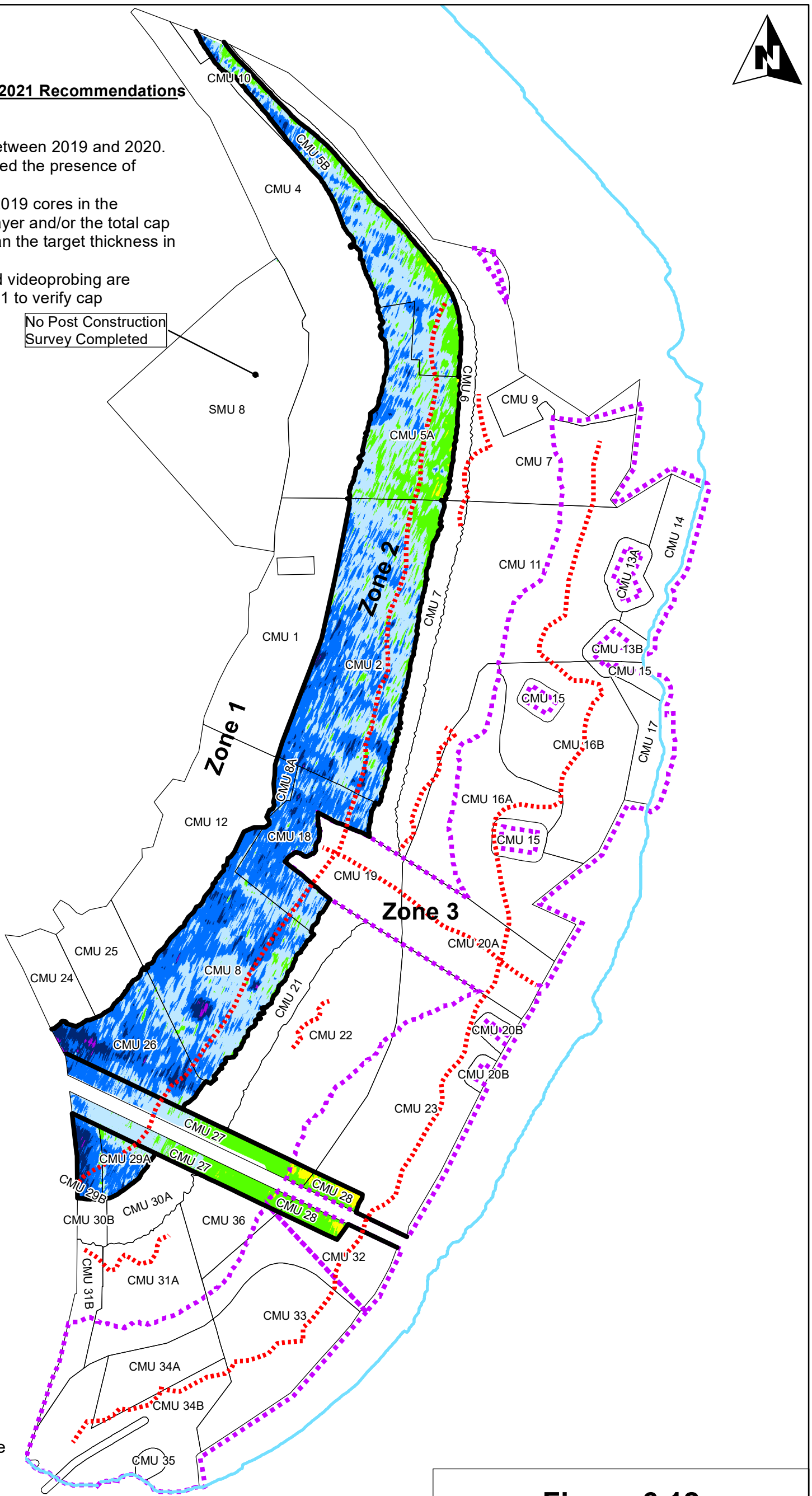


Figure 6.12

Honeywell

RA-E 2020 vs Asbuilt Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plot Date: 12/17/2021 Plotted By: Domanski, Joshua

Document Path: Q:\GIS\Hon_Syracuse\OLMMS\OMM Survey\2020 Survey\MXDs\RAE OMM Survey 2020_Rev1.mxd

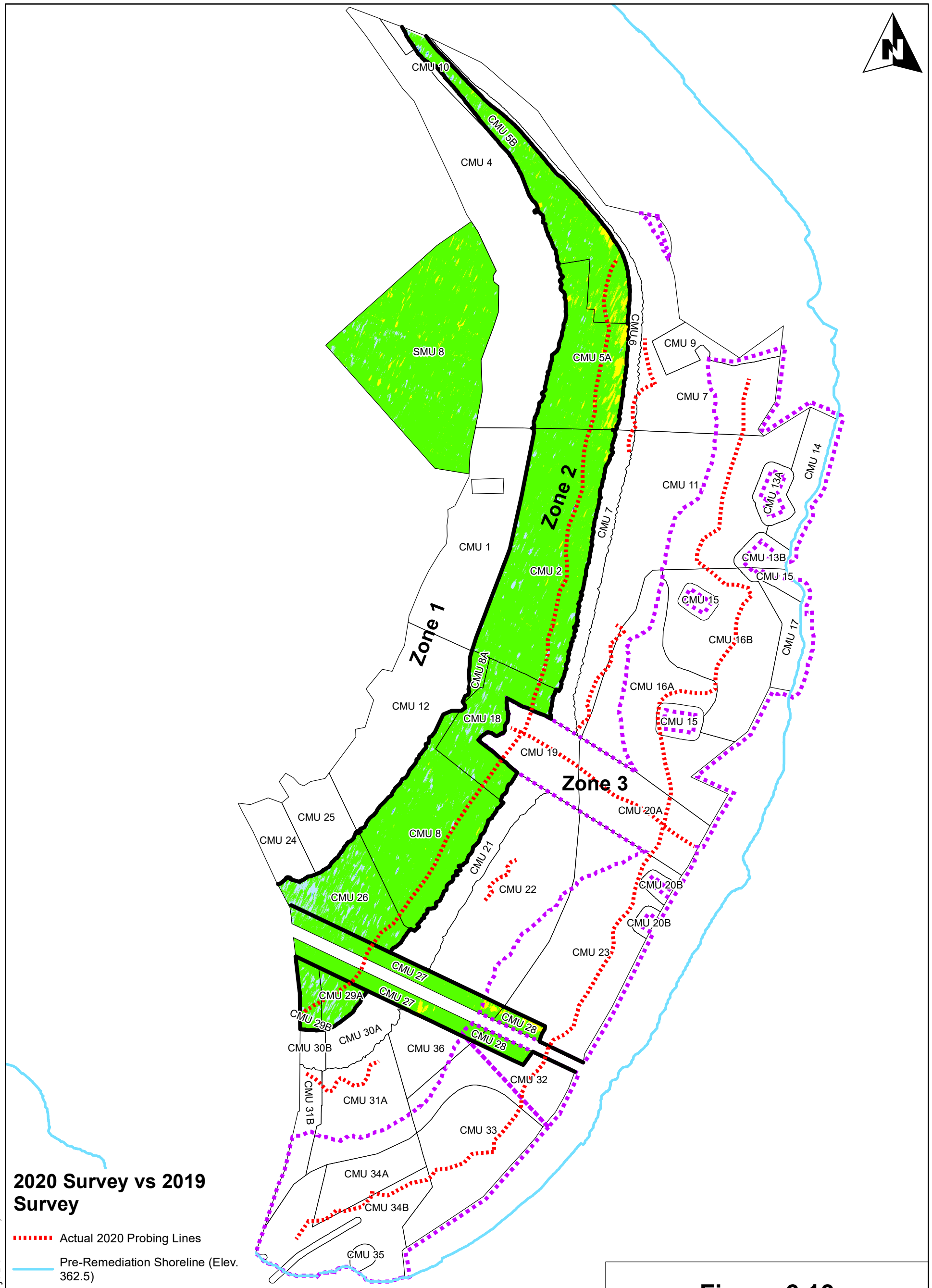


Figure 6.13

Honeywell

RA-E 2020 vs 2019 Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2020 Survey\MXDs\RAE OMM Survey 2019 v 2020.mxd

CMU 23

CMU 24

CMU 21

CMU 20

CMU 17

CMU 9

C-56

C-57

CMU 10

CMU 16

CMU 18

2020 Survey vs 2019 Survey

- Proposed 2021 Supplemental Core Location
- Inaccessible Area, Due To Shallow Water
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0 Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

0 125 250 Feet

Plotted By: Domanski, Joshua

Plot Date: 6/7/2021

Figure 6.14

Honeywell

RA-C Proposed 2021 Supplemental Physical Coring Locations

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Document Path: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\2020 OLMM Report\Figure 6.14_RAC 2021 Proposed Supplemental Cores_Rev1.mxd

CMU 46

CMU 45

CMU 7A

CMU 8

CMU 9

CMU 10B

CMU 23

D-56

D-55

2020 Survey vs Asbuilt Survey

- Proposed 2021 Supplemental Core Location
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

0 137.5 275 Feet

Figure 6.15

Honeywell

MPC Area RA-D-1B Proposed 2021 Supplemental Physical Coring Locations

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Domanski, Joshua

Plot Date: 5/18/2021

Document Path: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\2020 OLMM Report\Figure 6.15_RAD 2021 Proposed Supplemental Cores.mxd

APPENDIX 1A – 2020 SCOPE DOCUMENTATION

From:	Larson, Tim (DEC)
To:	Burnham, Anne
Cc:	McDonald, Michelle; Glaza, Edward; Arrigo, Mark; Hesler, Donald (DEC); Quail, Rebecca A (DEC); Crance, Mary Jo (DEC); Sergott, Mark S (HEALTH); Bob Nunes (Nunes.Robert@epa.gov); Joseph Heath (jjheath1946@gmail.com); Shenandoah, Jeanne; Hazel Powless (powlessh1@gmail.com); Alma Lowry (alma.lowry@gmail.com); Witt, David E (DEC); Spera, Mike
Subject:	[EXTERNAL] 2020 OL Fieldwork Scope Memo - Approval
Date:	Friday, July 3, 2020 8:03:02 AM
Attachments:	image002.jpg image004.png image006.png image008.jpg 2020 07 02 Final OL Fieldwork Scope Memo.pdf

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Anne,

The attached version of the scope memo is approved.

Thank you,

Timothy J. Larson, P.E.

Senior Project Manager, Division of Environmental Remediation

New York State Department of Environmental Conservation

625 Broadway, 12th Floor, Albany, NY 12233

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MEMORANDUM

July 2, 2020

To: Timothy Larson, NYSDEC

From: Ed Glaza, PE, Parsons

Subject: 2020 Onondaga Lake Scope

Below is a summary of the Onondaga Lake monitoring anticipated to be performed in 2020. We have been and continue to work through the challenges associated with Covid-19 and will notify NYSDEC if anticipated 2020 field work detailed below is further impacted.

SMU 8 Monitored Natural Recovery

Monitoring in 2020 related to MNR will consist of collection of analysis settling sediments as specified in the Onondaga Lake Monitoring and Maintenance Plan (OLMMP) (Parsons 2018). Routine monitoring of surface sediments is specified for 2020 in the OLMMP. In the Draft Onondaga Lake 2018 Annual and Comprehensive Monitoring and Maintenance report, it was documented that MNR is progressing faster than anticipated and therefore it was recommended that the 2020 sampling consist of the expanded sampling associated with the first compliance sampling event. Due to challenges associated with COVID-19, it is recommended that this sediment monitoring event for both compliance sampling as well as visual assessments of cores, be delayed until 2021.

Biota Tissue

Fish tissue monitoring conducted in 2020 will continue in accordance with the OLMMP, with minor proposed modifications as discussed below. Tissue monitoring of zooplankton will be conducted in 2020 in accordance with the OLMMP.

It is recommended that analysis of mercury and PCBs, as the primary contaminants of concern, be continued for all species in 2020. For hexachlorobenzene, DDT and metabolites, and dioxins/furans, it is recommended that analysis not be performed in 2020. These chemicals will be evaluated for inclusion in the 2021 monitoring program following receipt and evaluation of the 2019 data. Hexachlorobenzene, which has no target concentration, is consistently undetected or detected at only low concentrations in all species. Concentrations of DDT and metabolites have been consistently low with 95% UCL values below targets in small and large prey fish. These chemicals will be evaluated for inclusion in the 2021 monitoring program following receipt and evaluation of the 2019 data. Regarding dioxins/furans, concentrations are not consistently below the noncancer and cancer targets, with the exception of Pumpkinseed. It is expected that dioxins/furans will be included in the 2021 monitoring program, with the possible exception of Pumpkinseed. This determination will be made following evaluation of the 2019 data in coordination with NYSDEC.

In addition to the proposed changes in analytes outlined above, it is proposed that the species representing large prey fish be altered for monitoring in 2020 and future years of monitoring. As outlined in the Biota Tissue

Monitoring Work Plan of the OLMMP, twenty-four individual large prey fish will be collected each year, with large prey fish being defined as White Sucker (*Catostomus commersonii*) or similar. Historically, White Sucker have been the target species for large prey fish. White Sucker have been collected with difficulty in recent years due to changes in relative abundance from 1.14% during the Lakewide Baseline (2008 to 2011) to only 0.07% in both 2017 and 2018. Due to this lower abundance, White Sucker are no longer representative of an abundant large littoral prey fish. In recent years, a shift has been observed in the observance of other species of large preyfish. Greater Redhorse (*Moxostoma valenciennesi)*, Shorthead Redhorse (*Moxostoma macrolepidotum*), and Silver Redhorse (*Moxostoma anisurum*) are all species present within the lake that occupy a similar trophic level as White Sucker. Shorthead Redhorse is the only of these three species that has been present each year since lakewide baseline. As such, their abundance is not significantly higher than White Sucker, and therefore cannot entirely replace the collection of 24 individuals. It is recommended that for 2020 sampling, large prey fish collection will consist of 12 White Sucker and 12 Shorthead Redhorse.

The elimination of collecting environmental data (temperature, pH, conductivity, and dissolved oxygen concentration) with the collection of each tissue fish is proposed for 2020 sampling and beyond. These data are ancillary and have not been used in past analyses.

Surface Water

It was previously anticipated that additional surface water monitoring would occur in 2020 as documented in Section 4 of the 2018 Annual and Comprehensive Report. However, due to challenges associated with Covid-19, it is recommended that this monitoring be delayed until 2021. The proposed scope, including analytes, of this monitoring will be submitted to NYSDEC for review and approval under separate cover in advance of the 2021 field season.

Surface water monitoring will be completed as part of the Nitrate addition program, as documented in the Operations and Monitoring (OM) Plan for Nitrate Addition (Parsons and UFI 2014). Monitoring of surface water will be conducted in 2020 as specified in this plan, except for the elimination of monitoring for manganese, total dissolved gas, and ferrous iron. The elimination of these three parameters from the monitoring program was documented in the 2017 Annual Report for Nitrate Addition, which has been approved by the NYSDEC.

Cap Maintenance and Monitoring

Physical Monitoring

Cap physical monitoring will be completed in 2020 consistent with the OLMMP. This will consist of:

- Comprehensive probing and physical inspection, including drone aerial photography; and
- Comprehensive bathymetric survey of MPCs, MERCs and SMU 8 TLCs.

Any signs of potential erosion along the Wastebeds 1-8 stabilized shoreline will be photographed and noted during the shoreline inspection.

Additional physical monitoring to be completed in 2020 consists of:

- Bathymetric survey of RA-E Zone 2 (fine gravel) to further evaluate anomalies in core thickness measurements from the 2019 monitoring; and
- Completion of the supplemental probing in RA-E originally planned for 2019, as shown in Figure 6.32 of the Draft 2018 Annual and Comprehensive Monitoring Report. This supplemental probing was planned for 2019 but was not completed because the probing rods were damaged during field activities and could not be replaced prior to the conclusion of 2019 field activities.

It is understood that NYSDEC may require additional monitoring following receipt and review of the 2019 Annual Monitoring and Maintenance Report.

Chemical Monitoring

Consistent with the OLMMP, no cap chemical monitoring is scheduled for 2020. It is understood that NYSDEC may require additional monitoring following receipt and review of the 2019 Annual Monitoring and Maintenance Report.

Habitat Reestablishment and Biological Response

Habitat monitoring and maintenance will be completed in 2020 as specified in the OLMMP, including a wetland survey for Wastebed B and Harbor Brook as it is the third year of monitoring in that area. There are no other formal wetland surveys/delineations to be performed this year. However, due to challenges associated with Covid-19, benthic macroinvertebrate sampling, which was previously proposed to be carried out in 2020, will now be carried out in 2021.

References

Parsons and UFI. 2014. Operations and Monitoring Plan for Adding Nitrate to the Hypolimnion of Onondaga Lake. Prepared for Honeywell, August 2014.

Parsons. 2018. Onondaga Lake Monitoring and Maintenance Plan. Prepared for Honeywell, June 2018.

Parsons, 2020. Draft Onondaga Lake 2018 Annual and Comprehensive Monitoring and Maintenance Report. Prepared for Honeywell, April 2020.

APPENDIX 2A – MOUTH OF NINEMILE CREEK AND WASTEBED B/HARBOR BROOK OUTBOARD AREA PHOTOGRAPHIC LOG

Habitat Reestablishment Photographic Log
Onondaga Lake
Syracuse, NY



Photo Number: 1 Date: 9/10/20

Photo Description: View from Mouth of Ninemile Creek photo location 1



Photo Number: 2 Date: 8/28/20

Photo Description: View from Mouth of Ninemile Creek photo location 2



Photo Number: 3 Date: 9/10/20

Photo Description: View from Mouth of Ninemile Creek photo location 3

Habitat Reestablishment Photographic Log
Onondaga Lake
Syracuse, NY



Photo Number: 4 Date: 9/10/20

Photo Description: View from Mouth of Ninemile Creek photo location 4



Photo Number: 5 Date: 9/10/20

Photo Description: View from Mouth of Ninemile Creek photo location 5



Photo Number: 6 Date: 9/10/20

Photo Description: View from Mouth of Ninemile Creek photo location 6

Habitat Reestablishment Photographic Log
Onondaga Lake
Syracuse, NY



Photo Number: 7 Date: 7/17/20

Photo Description: View from Mouth of Ninemile Creek photo location 7



Photo Number: 8 Date: 7/17/20

Photo Description: View from Mouth of Ninemile Creek photo location 8



Photo Number: 9 Date: 9/10/20

Photo Description: View from Mouth of Ninemile Creek photo location 9



Photo Number: 10 Date: 8/28/20

Photo Description: View from Mouth of Ninemile Creek photo location 10



Photo Number: 11 Date: 9/10/20

Photo Description: View from Mouth of Ninemile Creek photo location 11



Photo Number: 12 Date: 7/17/20

Photo Description: View from Mouth of Ninemile Creek photo location 12



Photo Number: 13 Date: 8/12/20

Photo Description: View from Mouth of Ninemile Creek photo location 13



Photo Number: 14 Date: 7/17/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 1



Photo Number: 15 Date: 9/10/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 2

Habitat Reestablishment Photographic Log
Onondaga Lake
Syracuse, NY



Photo Number: 16 Date: 9/10/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 3



Photo Number: 17 Date: 9/10/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 4



Photo Number: 18 Date: 8/12/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 5



Photo Number: 19 Date: 7/27/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 6



Photo Number: 20 Date: 8/12/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 7



Photo Number: 21 Date: 6/7/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 8



Photo Number: 22 Date: 8/28/20

Photo Description: View from Outboard/Harbor Brook photo location 9



Photo Number: 23 Date: 8/28/20

Photo Description: View from Outboard/Harbor Brook photo location 10



Photo Number: 24 Date: 9/10/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 11



Photo Number: 25 Date: 9/10/20

Photo Description: View from Outboard/Harbor Brook photo location 12



Photo Number: 26 Date: 9/10/20

Photo Description: View from Outboard/Harbor Brook photo location 13



Photo Number: 27 Date: 8/28/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 14

Habitat Reestablishment Photographic Log
Onondaga Lake
Syracuse, NY



Photo Number: 28 Date: 8/28/20

Photo Description: View from Wastebed B/Harbor Brook Outboard Area photo location 15

APPENDIX 2B – VEGETATION DATA

TABLE 2B.1 2020 PLANT SPECIES OBSERVED IN RESTORATION AREAS

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Mouth of Ninemile Creek	Outboard/ Harbor Brook
Woody Species				
Acer negundo	Box elder	FAC	X	X
Acer rubrum	Red maple	FAC	X	X
Acer saccharinum	Silver maple	FACW	X	X
Acer xfreemanii	Freeman maple	UPL	X	X
Alnus incana ssp. *rugosa*	Speckled alder	FACW	X	X
Alnus serrulata	Brookside alder	OBL		X
Aronia arbutifolia	Red chokeberry	FACW	X	
Betula nigra	River birch	FACW		X
Celtis occidentalis	Hackberry	FAC		X
Cephalanthus occidentalis	Buttonbush	OBL	X	X
Cornus amomum	Silky dogwood	FACW	X	X
Frangula alnus	Glossy false buckthorn	FAC		X
Fraxinus americanus	White ash	FACU		X
Gleditsia triacanthos	Honey locust	FAC		X
Ilex verticillata	Common winterberry	FACW		X
Juniperus virginiana	Eastern red-cedar	FACU	X	X
Lonicera sp.	Honeysuckle	FAC		X
Morus alba	White mulberry	FACU		X
Parthenocissus quinquefolia	Virginia creeper	FACU	X	X
Pinus strobus	Eastern white pine	FACU	X	X
Platanus occidentalis	American sycamore	FACW	X	X
Populus deltoides	Eastern cottonwood	FAC	X	X
Populus tremuloides	Quaking aspen	FACU		X
Quercus bicolor	Swamp white oak	FACW	X	X
Quercus macrocarpa	Bur oak	FACU	X	
Quercus rubra	Northern red oak	FACU	X	
Rhus typhina	Staghorn sumac	UPL	X	X
Robinia pseudoacacia	Black locust	FACU	X	X
Rosa multiflora	Multiflower rose	FACU	X	
Rosa palustris	Swamp rose	OBL		X
Rubus occidentalis	Black raspberry	UPL		X
Salix discolor	Pussy willow	FACW	X	X
Salix interior	Sandbar willow	FACW	X	X
Salix nigra	Black willow	OBL		X
Sassafras albidum	Sassafras	FACU	X	
Spiraea alba	White meadowsweet	FACU	X	
Spiraea latifolia	Broadleaf meadowsweet	FACW		X
Thuja occidentalis	Northern whitecedar	FACW		X
Toxicodendron radicans	Eastern poison ivy	FAC	X	X
Viburnum dentatum	Southern arrowwood	FAC		X
Viburnum lentago	Nannyberry	FAC		X
Viburnum opulus	Highbush-cranberry	FACW	X	

TABLE 2B.1 2020 PLANT SPECIES OBSERVED IN RESTORATION AREAS

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Mouth of Ninemile Creek	Outboard/ Harbor Brook
Herbaceous Species				
Abutilon theophrastii	Velvetleaf	FACU	X	X
Acalypha rhomboidea	Common three-seed-mercury	FACU		X
Achillea millefolium	Common yarrow	FACU	X	
Acorus americana	Sweetflag	OBL		X
Agrostis gigantea	Redtop	FACW	X	
Agrostis stolonifera	Creeping bentgrass	FACW	X	
Alisma subcordatum	American water plantain	OBL	X	X
Alisma triviale	Northern water plantain	OBL	X	
Ambrosia artemisiifolia	Annual ragweed	FACU	X	X
Anagallis arvensis	Scarlet pimpernel	FACU		X
Andropogon gerardii	Big bluestem	FACU	X	X
Anthoxanthum odoratum	Sweet vernal grass	FACU	X	X
Apocynum cannabinum	Indian hemp	FAC	X	X
Arctium lappa	Greater burdock	UPL	X	X
Artemisia biennis	Biennial wormwood	FACW	X	
Artemisia vulgaris	Mugwort	UPL	X	X
Asclepias incarnata	Swamp milkweed	OBL	X	X
Asclepias syriaca	Common milkweed	UPL	X	X
Asclepias tuberosa	Butterfly milkweed	UPL	X	
Atriplex prostrata	Triangle orache	FAC	X	X
Azolla cristata	Crested mosquito fern	OBL	X	
Barbarea vulgaris	Garden yellow rocket	FAC	X	X
Bidens cernua	Nodding burr-marigold	OBL	X	
Bidens connata	Purplestem beggarticks	UPL	X	X
Bidens frondosa	Devil's beggartick	FACW	X	X
Boehmeria cylindrica	Small-spike false nettle	OBL	X	X
Bolboschoenus maritimus ssp. *paludosus*	American saltmarsh bulrush	OBL	X	
Bolboschoenus robustus	Sturdy bulrush	OBL		X
Boltonia asteroides	White doll's daisy	FACW	X	
Brassica nigra	Black mustard	UPL	X	X
Calystegia sepium	Hedge false bindweed	FAC	X	X
Cardamine impatiens	Narrowleaf bittercress	FAC	X	
Carex comosa	Longhair sedge	OBL		X
Carex granularis	Limestone meadow sedge	FACW		X
Carex lupulina	Hop sedge	OBL		X
Carex lurida	Shallow sedge	OBL	X	X
Carex scoparia	Broom sedge	FACW	X	X

TABLE 2B.1 2020 PLANT SPECIES OBSERVED IN RESTORATION AREAS

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Mouth of Ninemile Creek	Outboard/ Harbor Brook
Carex vulpinoidea	Fox sedge	OBL	X	X
Centaurea jacea	Brown-ray knapweed	FACU		X
Centaurea nigra	Lesser knapweed	FACU	X	X
Centaurea stoebe	Spotted knapweed	FAC	X	X
Centaurea xmoncktonii	Meadow knapweed	FACU		X
Centaurium erythraea	European centaury	FAC	X	
Ceratophyllum demersum	Coontail	OBL	X	X
Chamaecrista fasciculata	Sleepingplant	FACU		X
Cichorium intybus	Chicory	FACU		X
Cicuta maculata	Spotted water hemlock	OBL		X
Cirsium arvense	Canada thistle	FACU	X	X
Cirsium vulgare	Bull thistle	FACU	X	X
Conium maculatum	Poison-hemlock	FACW		X
Corylus americana	American hazelnut	FACU	X	
Cucurbita pepo	Pumpkin	UPL		X
Cyperus bipartitus	Shining flat sedge	FACW	X	X
Cyperus esculentus	Yellow nutsedge	FACW	X	X
Dasiphora fruticosa	Shrubby cinquefoil	FACW		X
Daucus carota	Queen Anne's lace	UPL	X	X
Desmodium canadense	Showy tick-trefoil	FAC	X	X
Dianthus armeria	Deptford pink	UPL	X	
Dichanthelium sp.	Rosette grass	FAC	X	X
Diplachne fusca	Bearded strangletop	OBL	X	
Dipsacus fullonum	Fuller's teasel	FACU	X	X
Dysphania botrys	Jerusalem-oak	FACU		X
Echinochloa sp.	Barnyardgrass	FACW	X	X
Eleocharis palustris	Common spike rush	OBL	X	
Elodea canadensis	Common waterweed	OBL	X	X
Elymus virginicus	Virginia wildrye	FACW	X	X
Epilobium ciliatum	Fringed willowherb	FACW		X
Epilobium parviflorum	Small-flower hairy willowherb	FACW		X
Equisetum arvense	Field horsetail	FAC	X	
Eragrostis hypnoides	Teal love grass	OBL	X	
Erechtites hieracifolius	American burnweed	FAC		X
Erigeron annuus	Eastern daisy fleabane	FACU	X	X
Eupatorium altissimum	Tall thoroughwort	UPL	X	
Eupatorium perfoliatum	Common boneset	FACW	X	X
Euphorbia maculata	Spotted sandmat	FACU		X
Euthamia graminifolia	Flat-top goldenrod	FAC	X	X
Eutrochium fistulosum	Trumpetweed	FACW		X
Eutrochium maculatum	Spotted joe pye weed	OBL	X	X
Fragaria sp.	Strawberry	FACU		X
Galium album	White bedstraw	FACU	X	X
Galium palustre	Common marsh bedstraw	OBL	X	X
Geum laciniatum	Rough avens	FACW		X
Glyceria striata	Fowl mannagrass	OBL		X
Helenium autumnale	Common sneezeweed	FACW	X	X
Heliopsis helianthoides	Ox-eye sunflower	FACU	X	X
Heteranthera dubia	Grassleaf mudplantain	OBL	X	X

TABLE 2B.1 2020 PLANT SPECIES OBSERVED IN RESTORATION AREAS

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Mouth of Ninemile Creek	Outboard/ Harbor Brook
Hibiscus moscheutos	Swamp rose mallow	OBL	X	X
Hieracium sp.	Hawkweed	UPL	X	
Hypericum perforatum	Common St. John's-wort	UPL	X	X
Hypericum punctatum	Spotted St. John's-wort	FAC	X	
Impatiens capensis	Spotted jewelweed	FACW	X	X
Iris pseudacorus	Pale-yellow iris	OBL		X
Iris versicolor	Harlequin blueflag	OBL	X	X
Juncus effusus	Common rush	OBL	X	X
Lactuca sp.	Lettuce	FAC		X
Lathyrus latifolius	Perennial pea	UPL		X
Leersia oryzoides	Rice cutgrass	OBL	X	X
Lemna minor	Common duckweed	OBL	X	X
Leucanthemum vulgare	Oxeye daisy	UPL	X	X
Lindera benzoin	Northern spicebush	FACW		X
Lipandra polysperma var. polysperma	Many-seeded goosefoot	UPL		X
Lobelia cardinalis	Cardinal flower	OBL		X
Lobelia siphilitica	Great blue lobelia	FACW	X	X
Lotus corniculatus	Birdsfoot trefoil	FACU	X	X
Ludwigia palustris	Marsh primrose-willow	OBL		X
Lycopus americanus	American water horehound	OBL	X	X
Lycopus virginicus	Virginia water horehound	OBL		X
Lythrum salicaria	Purple loosestrife	OBL	X	X
Malva moschata	Musk mallow	UPL	X	X
Medicago lupulina	Black medick	FACU	X	
Melilotus albus	White sweet-clover	FACU		X
Melilotus officinalis	Sweetclover	FACU	X	
Mentha canadensis	American wild mint	FACW		X
Mimulus ringens	Allegheny monkeyflower	OBL	X	X
Monarda fistulosa	Wild bergamot	FACU	X	X
Myrica gale	Sweetgale	OBL		X
Myriophyllum sibiricum	Sibirian watermilfoil	OBL	X	X
Najas guadalupensis	Guadalupe waternymph	OBL	X	
Nasturtium officinale	Water cress	OBL		X
Nitellopsis obtusa	Starry stonewort	OBL	X	
Nuphar lutea	Yellow pond-lily	OBL	X	X
Nymphaea odorata	White water lily	OBL	X	X
Oenothera biennis	Common evening primrose	FACU	X	X
Oxalis stricta	Wood sorrel	FACU	X	X
Oxybasis glauca	Oakleaf goosefoot	FACW	X	X
Panicum capillare	Common panic grass	FAC		X
Panicum dichotomiflorum	Fall panic grass	FACW	X	X
Panicum virgatum	Switchgrass	FAC	X	X
Peltandra virginica	Green arrow arum	OBL	X	X
Penstemon digitalis	Foxglove beardtongue	FAC	X	X
Persicaria amphibia	Water smartweed	OBL	X	
Persicaria lapathifolia	Curlytop knotweed	FACW	X	X
Persicaria maculosa	Spotted lady's-thumb	FAC		X
Persicaria pensylvanica	Pennsylvania smartweed	FACW	X	X
Phalaris arundinacea	Reed canarygrass	FACW	X	X

TABLE 2B.1 2020 PLANT SPECIES OBSERVED IN RESTORATION AREAS

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Mouth of Ninemile Creek	Outboard/ Harbor Brook
Phleum pratense	Timothy	FACU	X	
Phragmites australis	Common reed	FACW		X
Picris hieracioides	Hawkweed oxtongue	UPL	X	X
Pilea sp.	Clearweed	FAC		X
Plantago lanceolata	Narrowleaf plantain	FACU	X	X
Plantago major	Great plantain	FACU	X	X
Poa compressa	Canada bluegrass	FACU	X	X
Pontederia cordata	Pickerelweed	OBL	X	X
Portulaca oleracea	Purslane	FACU		X
Potamogeton crispus	Curly-leaf pondweed	OBL	X	X
Potamogeton illinoensis	Illinois pondweed	OBL	X	X
Potentilla anserina	Silverweed	FACW		X
Potentilla fruticosa	Shrubby cinquefoil	FACW		X
Potentilla norvegica	Norwegian cinquefoil	FAC	X	X
Prunella vulgaris	Eurasian selfheal	FAC	X	X
Ranunculus acris	Tall buttercup	FAC	X	
Rorippa palustris	Bog yellowcress	OBL	X	X
Rudbeckia hirta	Black-eyed Susan	FACU	X	X
Rumex altissimus	Wood pale dock	FACW		X
Rumex crispus	Curly dock	FAC	X	X
Rumex obtusifolius	Bitter dock	FAC		X
Sagittaria latifolia	Broadleaf arrowhead	OBL	X	X
Sambucus nigra ssp. *canadensis*	American black elderberry	FACW		X
Saururus cernuus	Lizard's tail	OBL	X	
Schoenoplectus acutus	Hardstem bulrush	OBL	X	X
Schoenoplectus pungens	Common threesquare	OBL	X	X
Schoenoplectus tabernaemontani	Softstem bulrush	OBL	X	X
Scirpus atrovirens	Green bulrush	OBL	X	X
Scirpus cyperinus	Cottongrass bulrush	OBL	X	X
Securigera varia	Crownvetch	UPL	X	X
Senna hebecarpa	American senna	FACW		X
Sicyos angulatus	Bur cucumber	FACW		X
Sisyrhinchium angustifolium	Narrowleaf blue-eyed grass	FAC	X	X
Solanum carolinense	Carolina horse nettle	FACU		X
Solidago canadensis	Canada goldenrod	FACU	X	X
Solidago gigantea	Giant goldenrod	FACW	X	
Solidago rigida	Stiff goldenrod	FACU	X	
Sonchus arvensis	Field sow thistle	FACU		X
Sonchus asper	Spiny leaf sow thistle	FACU		X
Sparganium americanum	American burr-reed	OBL	X	X
Sparganium eurycarpum	Giant bur-reed	OBL	X	X
Spartina alterniflora	Smooth cordgrass	OBL	X	
Spartina pectinata	Prairie cordgrass	FACW	X	X
Spirodela polyrhiza	Common duckmeat	OBL	X	X
Stuckenia pectinata	Sago pondweed	OBL	X	X
Symphyotrichum lanceolatum	White panicled American aster	FACW	X	
Symphyotrichum lateriflorum	Calico aster	FAC	X	
Symphyotrichum novae-angliae	New England aster	FACW	X	X
Symphyotrichum pilosum	Frostweed aster	FACU	X	X

TABLE 2B.1 2020 PLANT SPECIES OBSERVED IN RESTORATION AREAS

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Mouth of Ninemile Creek	Outboard/ Harbor Brook
Symphyotrichum puniceum	Purplestem aster	OBL	X	X
Taraxacum officinale	Common dandelion	FACU	X	
Trifolium aureum	Golden clover	UPL	X	
Trifolium hybridum	Alsike clover	FACU	X	
Trifolium pratense	Red clover	FACU	X	
Tussilago farfara	Colt's foot	FACU		X
Typha angustifolia	Narrowleaf cattail	OBL	X	X
Typha latifolia	Broadleaf cattail	OBL	X	X
Typha x glauca	Hybrid cattail	OBL	X	X
Vallisneria americana	American eel-grass	OBL	X	X
Verbascum blattaria	Moth mullein	FACU		X
Verbascum thapsus	Common mullein	UPL		X
Verbena hastata	Blue vervain	FACW	X	X
Verbena urticifolia	White vervain	FAC	X	
Vernonia noveboracensis	New York ironweed	FACW	X	X
Veronica anagallis-aquatica	Water speedwell	OBL	X	
Vicia cracca	Cow vetch	FACU	X	X
Vitis riparia	Riverbank grape	FAC	X	X
Xanthium strumarium	Rough cocklebur	FAC	X	X
Zizania aquatica	Wild rice	OBL	X	

1 Botanical nomenclature follows Mitchell and Tucker (1997)

2 Wetland Indicator Status nomenclature:

- Obligate Wetland (OBL): occurs almost always (estimated probability >99%) in wetlands.
- Facultative Wetland (FACW): usually occurs in wetlands (estimated probability 67%-99%),
- Facultative (FAC): equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
- Facultative Upland (FACU): usually occurs in non-wetlands (estimated probability 67%-99%),
- Obligate Upland (UPL): occurs almost always (estimated probability >99%) in non-wetlands.

3 References for Wetland Statuses throughout document from the following:

http://plants.usda.gov

https://gobotany.newenglandwild.org

TABLE 2B.2 2020 QUANTITATIVE VEGETATION MONITORING PLOT PERCENT PLANT COVERS, MOUTH OF NINEMILE CREEK WETLAND RESTORATION AREA

Wetland Monitoring Locations		
Monitoring Location	Total Plant Cover	Total Invasive Cover[1]
Ninemile Creek Spits		
Plot 30	100%	0%
Plot 31	80%	0%
Plot 32	80%	0%
Plot 33	100%	0%
Plot 34	100%	1%
Plot 35	100%	0%
Plot 36	80%	0%
Plot 37	100%	0%
Plot 38	100%	0%
Plot 39	100%	0%
Plot 40	100%	0%
Plot 41	95%	0%
Plot 42	45%	0%
Plot 43	100%	1%
Plot 44	100%	2%
Plot 45	100%	0%
Plot 46	100%	0%
Plot 47	90%	0%
2020 Average Cover[2]	92.8%	0.22%
In-Lake Planted Areas		
Plot 1	100%	0%
Plot 2	100%	0%
Plot 3	100%	0%
Plot 4	100%	0%
Plot 5	95%	0%
Plot 6	100%	0%
Plot 7	100%	0%
Plot 8	100%	0%
Plot 9	10%	0%
Plot 10	90%	0%
Plot 11	90%	0%
Plot 12	100%	0%
Plot 13	50%	0%
Plot 14	80%	0%
Plot 15	30%	0%
Plot 16	100%	0%
Plot 17	95%	0%
Plot 18	100%	0%
Plot 19	100%	0%
Plot 20	80%	0%
Plot 21	80%	0%
Plot 22	100%	0%
Plot 23	20%	0%

P:\Honeywell -SYR\452284 2020 Onondaga Lake PVM\09 Reports\9.1 2020 Annual Report\Rev 0\Appendices\Appendix 2B - Vegetation Data\Appendix 2B tables 7-19.xlsx\2B.2 RAA Plot

TABLE 2B.2 2020 QUANTITATIVE VEGETATION MONITORING PLOT PERCENT PLANT COVERS, MOUTH OF NINEMILE CREEK WETLAND RESTORATION AREA

Wetland Monitoring Locations		
Monitoring Location	Total Plant Cover	Total Invasive Cover[1]
Plot 24	40%	0%
Plot 25	60%	0%
Plot 26	40%	0%
Plot 27	50%	0%
Plot 28	45%	0%
Plot 29	40%	0%
Plot 48	95%	0%
Plot 49	95%	0%
Plot 50	70%	0%
Plot 51	75%	0%
Plot 52	75%	0%
Plot 53	50%	0%
Plot 54	50%	0%
Plot 55	60%	0%
Plot 56	15%	0%
Plot 57	50%	0%
Plot 58	60%	0%
Plot 59	10%	0%
2020 Average Cover[3]	**70.7%**	**0.00%**

[1]Table 7.4 of the OLMMP provides a list of invasive vegetative species to be managed

[2] The OLMMP thresholds for the Ninemile Creek Spits after the fourth growing season are total wetland plant cover is at least 85 percent and invasive wetland species are not present.

[3] The OLMMP thresholds for the Ninemile Creek in-lake planted areas after the fourth growing season are total wetland plant cover is at least 70 percent and invasive wetland species are not present.

TABLE 2B.3 2020 RELATIVE COVER OF DIFFERENT WETLAND INDICATOR STATUS VEGETATION TYPES, MOUTH OF NINEMILE CREEK RESTORATION AREA

Wetland Indicator Status[1,2]	Overall (%)[3]
UPL	0.1
FACU	0.8
FAC	1.5
FACW	10.4
OBL	87.3

[1] Wetland Indicator Status nomenclature:
- Obligate Wetland (OBL): occurs almost always (estimated probability >99%) in wetlands.
- Facultative Wetland (FACW): usually occurs in wetlands (estimated probability 67%-99%), but is occasionally found in non-wetlands.
- Facultative (FAC): equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
- Facultative Upland (FACU): usually occurs in non-wetlands (estimated probability 67%-99%), but is occasionally found in wetlands (estimated probability 1%-33%).
- Obligate Upland (UPL): occurs almost always (estimated probability >99%) in non-wetlands.

[2] References for Wetland Statuses throughout document from the following:
http://plants.usda.gov
https://gobotany.newenglandwild.org

[3] Calculated from all sampling plots combined.

TABLE 2B.4 2020 QUANTITATIVE VEGETATION MONITORING PLOT PERCENT PLANT COVERS, WASTEBED B/HARBOR BROOK OUTBOARD AREA

Monitoring Location	Total Plant Cover	Total Invasive Cover[1]
Upland Areas		
Plot 15	100%	0%
Plot 16	100%	3%
Plot 18	100%	2%
Plot 25	100%	0%
Plot 44	100%	2%
Plot 48	100%	0%
Plot 49	100%	0%
2020 Average Cover[2]	**100.0%**	**1.0%**
Wetland Areas		
Plot 1	70%	0%
Plot 2	65%	0%
Plot 3	98%	0%
Plot 4	100%	0%
Plot 5	100%	0%
Plot 6	100%	5%
Plot 7	100%	0%
Plot 8	100%	0%
Plot 9	100%	0%
Plot 10	100%	2%
Plot 11	100%	0%
Plot 12	100%	2%
Plot 13	100%	1%
Plot 14	100%	0%
Plot 17	100%	0%
Plot 19	100%	0%
Plot 20	100%	3%
Plot 21	80%	0%
Plot 22	80%	0%
Plot 23	100%	0%
Plot 24	100%	0%
Plot 26	100%	0%
Plot 27	75%	0%
Plot 28	100%	0%
Plot 29	100%	0%

TABLE 2B.4 2020 QUANTITATIVE VEGETATION MONITORING PLOT PERCENT PLANT COVERS, WASTEBED B/HARBOR BROOK OUTBOARD AREA

Monitoring Location	Total Plant Cover	Total Invasive Cover[1]
Plot 30	80%	0%
Plot 31	100%	0%
Plot 32	100%	0%
Plot 33	100%	3%
Plot 34	60%	0%
Plot 35	90%	0%
Plot 36	100%	2%
Plot 37	90%	2%
Plot 38	95%	0%
Plot 39	90%	0%
Plot 40	85%	0%
Plot 41	100%	0%
Plot 42	70%	0%
Plot 43	100%	2%
Plot 45	50%	1%
Plot 46	0%	0%
Plot 47	0%	0%
Plot 50	100%	1%
Plot 51	100%	2%
Plot 52	65%	0%
Plot 53	100%	1%
Plot 54	100%	0%
Plot 55	100%	0%
Plot 56	100%	1%
Plot 57	100%	0%
Plot 58	30%	0%
2020 Average Cover[3]	**87.7%**	**0.5%**
25' Planted Buffer		
Plot 59	75%	0%
Plot 60	50%	0%
Plot 61	5%	0%
Plot 62	10%	0%
Plot 63	80%	0%
Plot 64	5%	0%
2020 Average Cover[4]	**27.5%**	**0.0%**

[1]Table 7.4 of the OLMMP provides a list of invasive vegetative species to be managed

[2] The OLMMP thresholds for planted upland areas after the third full growing season are total plant cover is at least 85 percent and Invasive species are not present

[3] The OLMMP thresholds for planted wetland areas after the third full growing season are total wetland plant cover is at least 80 percent and invasive wetland species are not present.

[4]The 25' Planted Buffer is outside of the Wastebed B/Harbor Brook Outboard Area boundary.

TABLE 2B.5 2020 RELATIVE COVER OF DIFFERENT WETLAND INDICATOR STATUS VEGETATION TYPES WASTEBED B/HARBOR BROOK OUTBOARD AREA

Wetland Indicator Status[1,2]	Overall (%)[3]
UPL	1.6%
FACU	4.4%
FAC	4.8%
FACW	11.9%
OBL	77.2%

[1] Wetland Indicator Status nomenclature:

- Obligate Wetland (OBL): occurs almost always (estimated probability >99%) in wetlands.
- Facultative Wetland (FACW): usually occurs in wetlands (estimated probability 67%-99%), but is occasionally found in non-wetlands.
- Facultative (FAC): equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
- Facultative Upland (FACU): usually occurs in non-wetlands (estimated probability 67%-99%), but is occasionally found in wetlands (estimated probability 1%-33%).
- Obligate Upland (UPL): occurs almost always (estimated probability >99%) in non-wetlands.

[2] References for Wetland Statuses throughout document from the following:
http://plants.usda.gov
https://gobotany.newenglandwild.org

[3] Calculated from all sampling plots combined.

TABLE 2B.6 2020 PLANT INSTALLATION SUMMARY
MOUTH OF NINEMILE CREEK AND WASTEBED B/HARBOR BROOK OUTBOARD AREAS

Scientific Name	Common Name	MoNMC Quantity	OB/HB Quantity
Large Trees			
Betula nigra	River birch	-	1
Salix nigra	Black willow	-	7
Thuja occidentalis	Northern white cedar	-	2
Acer rubrum	Red maple	-	1
	Total	**0**	**11**
Plugs			
Acorus americana	Sweet flag	-	250
Bolboschoenus robustus	Sturdy bulrush	550	750
Eleocharis obtusa	common spikerush	-	500
Hibiscus moscheutos	Swamp rose mallow	250	400
Iris versicolor	Blue flag iris	250	250
Juncus effusus	Soft rush	50	200
Nuphar lutea	Spatterdock	2500	4850
Nymphaea odorata	American white water lily	2200	2400
Peltandra virginica	Green arrow arum	-	100
Pontederia cordata	Pickerelweed	4750	3950
Schoenoplectus acutus	Hardstem bulrush	1950	575
Schoenoplectus robustus	Sturdy bulrush	700	-
Schoenoplectus tabernaemontanii	Softstem Bulrush	3150	2100
Scirpus atrovirens	Green bulrush	600	-
Sparganium americanum	American burreed	750	450
Sparganium eurycarpum	Giant burreed	750	450
Spartina alterniflora	Smooth cordgrass	2300	500
Typha latifolia	Broadleaf cattail	500	500
	Total	**21250**	**18225**
Bare Root Trees/Shrubs			
Betula nigra	River birch	-	50
Cephalanthus occidentalis	Buttonbush	-	200
Juniperus virginiana	Eastern red-cedar	-	50
Prunus pumila	Sand cherry	-	100
Prunus serotina	Black willow	-	50
Rhus copallinum	Winged sumac	-	50
Rosa palustris	Wetland rose	-	100
Salix discolor	Pussy willow	-	150
	Total	**0**	**750**

ONONDAGA LAKE

SYW-10

NINEMILE CREEK

LEGEND:

- LAKE CONTOURS-1' INTERVAL (POST REMEDY CONTOURS SHOWN)
- PROTECTIVE EDGE
- REMEDIATION AREA A BOUNDARY
- SHORELINE (362.5')
- SHORELINE STABILIZATION AND ENHANCEMENT AREA
- NINEMILE CREEK SPITS
- PLANTED AREAS
- PHOTO LOCATIONS AND DIRECTION
- NINEMILE CREEK SPITS PLOTS
- IN-LAKE PLANTED AREA PLOTS



KEY PLAN
NOT TO SCALE

150 0 150 300

SCALE: 1"=150'

FIGURE 2B.1

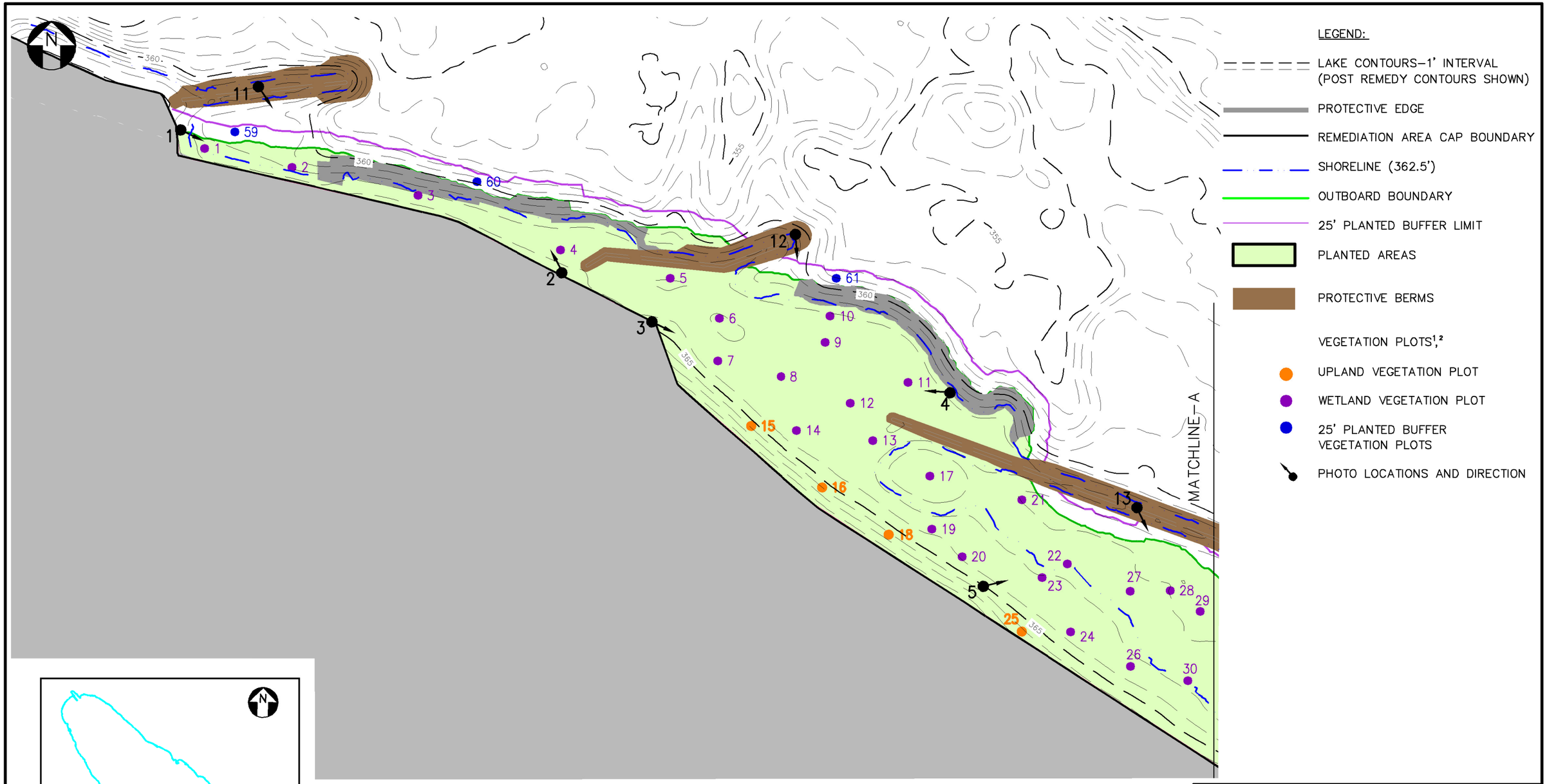
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

MOUTH OF NINEMILE CREEK
PLANTED AREA VEGETATION
MONITORING PLOTS AND
PHOTOGRAPH LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704-ANNUALRPT-2020-04.DWG
PLOT DATE: 3/1/2021 1:36 PM PLOTTED BY: RUSSO, JILL





1. PLOTS 6, 7, 8, 13, 14, 15, 16, 18, 19, 20, AND 25 MONITORED FOR HERBACEOUS AND WOODY COMPONENTS. ALL OTHER PLOTS ARE HERBACEOUS ONLY.

2. PLOTS 59, 60, AND 61 CONDUCTED WITH A THROW RAKE DUE TO WATER DEPTH.

150 0 150 300

SCALE: 1"=150'

FIGURE 2B.2

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA VEGETATION MONITORING PLOTS AND PHOTOGRAPH LOCATIONS

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704-ANNUALRPT-2020-05.DWG
PLOT DATE: 7/19/2021 3:52 PM PLOTTED BY: RUSSO, JILL

N

MATCHLINE – A

LEGEND:

- LAKE CONTOURS–1' INTERVAL (POST REMEDY CONTOURS SHOWN)
- PROTECTIVE EDGE
- REMEDIATION AREA CAP BOUNDARY
- SHORELINE (362.5')
- OUTBOARD BOUNDARY
- 25' PLANTED BUFFER LIMIT
- PLANTED AREAS
- PROTECTIVE BERMS
- STREAM

VEGETATION PLOTS[1,2]

- UPLAND VEGETATION PLOT
- WETLAND VEGETATION PLOT
- 25' PLANTED BUFFER VEGETATION PLOTS
- PHOTO LOCATIONS AND DIRECTION

HARBOR BROOK

ONONDAGA LAKE

1. PLOTS 43, 44, 45, 48, 49, 50, 51 MONITORED FOR HERBACEOUS AND WOODY COMPONENTS. ALL OTHER PLOTS ARE HERBACEOUS ONLY.

2. PLOTS 59, 60, AND 61 CONDUCTED WITH A THROW RAKE DUE TO WATER DEPTH.

KEY PLAN
NOT TO SCALE

150 0 150 300

SCALE: 1"=150'

FIGURE 2B.3

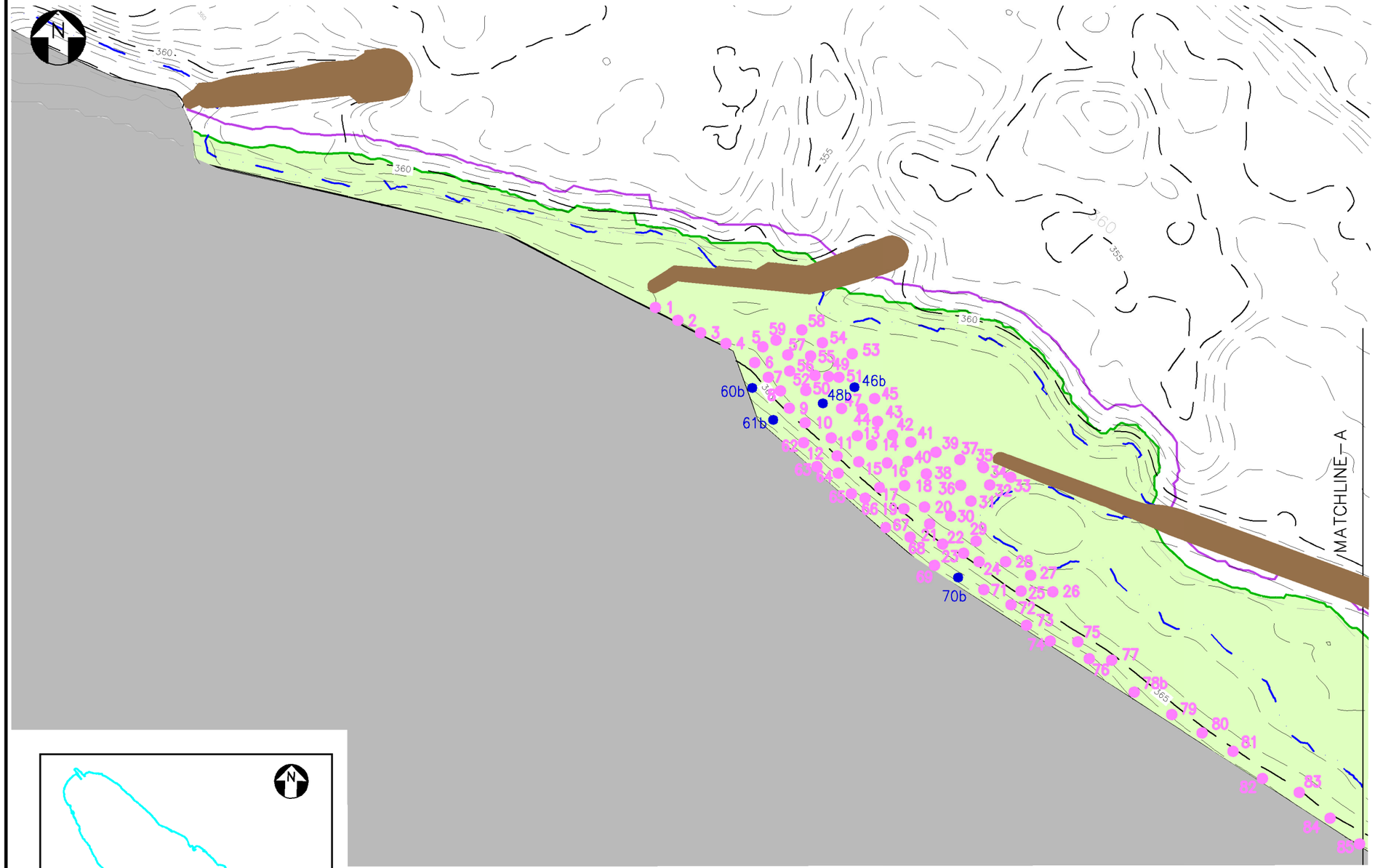
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

EASTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA VEGETATION MONITORING PLOTS AND PHOTOGRAPH LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704-ANNUALRPT-2020-05.DWG
PLOT DATE: 7/19/2021 3:54 PM PLOTTED BY: RUSSO, JILL





150 0 150 300

SCALE: 1"=150'

FIGURE 2B.4

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA
LARGE TREE LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\450704 2017–2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704–AR–TREES–2020.DWG
PLOT DATE: 3/1/2021 1:27 PM PLOTTED BY: RUSSO, JILL

N

MATCHLINE – A

355

360

355

360

360

360

LEGEND:

LAKE CONTOURS–1' INTERVAL (POST REMEDY CONTOURS SHOWN)

REMEDIATION AREA CAP BOUNDARY

SHORELINE (362.5')

OUTBOARD BOUNDARY

25' PLANTED BUFFER LIMIT

PLANTED AREAS

PROTECTIVE BERMS

LARGE TREE LOCATIONS

LAGRE TREE LOCATIONS (REPLACED)

PHOTO LOCATIONS AND DIRECTION

86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103

HARBOR BROOK

360

150 0 150 300

SCALE: 1"=150'

N

ONONDAGA LAKE

KEY PLAN
NOT TO SCALE

FIGURE 2B.5

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

EASTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA
LARGE TREE LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2020 ANNUAL REPORT\450704-AR-TREES-2020.DWG
PLOT DATE: 2/24/2021 4:08 PM PLOTTED BY: RUSSO, JILL

APPENDIX 2C – WASTEBED B/HARBOR BROOK OUTBAORD AREA YEAR 3 WETLAND SURVEY

FORMAL WETLAND SURVEY
WASTEBED B/HARBOR BROOK OUTBOARD AREA
TOWN OF GEDDES, ONONDAGA COUNTY, NY

Prepared For:

PARSONS

301 Plainfield Road

Suite 350

Syracuse, NY 13212

Prepared by:

Joseph M. McMullen, Senior PWS

17 Quail Path

Liverpool, NY 13090

August 2022

INTRODUCTION

A wetland survey was performed in Wastebed B/Harbor Brook outboard areas located along the southwestern shoreline of Onondaga Lake in 2020. Such a survey is required during Year 3 as part of the success criteria monitoring in the monitoring and maintenance plan for the area.

METHODS

Joseph McMullen and Parsons personnel performed a survey of the wetlands and associated aquatic resources in the restoration areas of the Wastebed B/Harbor Brook outboard areas located along the southwestern shore of Onondaga Lake. The field portion of the survey was performed on September 2, 2020. Surveyors ribbon was used by Mr. McMullen to delineate the edges of areas dominated with wetland vegetation. Each surveyor ribbon flag point was located by Parsons using a Trimble SPS995 GPS unit, with sub 2-inch accuracy. GPS location efforts occurred immediately after the flags were placed.

Information on common plant species in each wetland community were noted during the field effort. Overall plant cover was noted, as was the presence of invasive species. General information on wildlife usage was collected, along with representative photographs of the areas.

GPS points were plotted on a wetland survey figure of the area and provided the basis for Figures 1 and 2. Cover types were determined using field observations and aerial photographs. Acreage of each wetland cover type within the surveyed wetland areas were determined by Parson and are presented in Table 1. Representative photographs of the area taken during the field efforts are provided.

RESULTS

Results of the wetlands survey and associated aquatic resources survey are shown on Figures 1 and 2, with acreage of the wetland areas presented in Table 1. Location and direction of representative photographs are shown on Figures 1 and 2, and displayed in attached photo log. A description of each wetland plant community is provided in the following text. Scientific names of plants follow those used in the New York Flora Atlas (Weldy et al. 2020).

The wetlands of the Wastebed B/Harbor Brook outboard areas are located along the southwestern edge of Onondaga Lake. They extend from the southern lake shore at the mouth of Harbor Brook northwest along the western lake shore for a distance of approximately 3200 feet (Figures 1 and 2). Based on the current survey, there are a total of 10.8 acres of wetlands in the area (Table 1). As a result of community expansion of planted wetlands, the surveyed wetland boundary slightly exceeds the designed site limits in some areas. Because the areas exceeding the design boundary are a result of the restoration, they are included in the 10.8 acre estimate of

wetland area. Vegetation cover types are primarily persistent emergent wetlands, with some areas of non-persistent/aquatic bed wetlands, and scrub-shrub/young-forested wetlands (Figures 1 and 2). Throughout the area, there is also often a narrow band of woody vegetation along the landward edge of the wetlands, which transitions to the well-vegetated upland bank.

Persistent Emergent Wetlands

Persistent emergent is the most common wetland cover type in the area, with a total of 5.73 acres in the southern and southwestern shoreline areas (Figures 1 and 2, Table 1). Vegetation is very dense in this cover type, with total cover of 100%. There is a diverse mix of native species in the area. Common species include: broadleaf cattail (*Typha latifolia*), softstem bulrush (*Schoenoplectus tabernaemontani*), bur-reed (*Sparganium spp*.), nutsedge (*Cyperus* sp.), dock-leaved smartweed (*Persicaria lapathifolia*), switch grass (*Panicum virgatum*), rosemallow (*Hibiscus moscheutos*), Cocklebur (*Xanthium strumarium*), Joe pye weed (*Eutrochium maculatum*), rice cutgrass (*Leersia oryzoides*), and American burnweed (*Erechtites hieraciifolius*). Broadleaf cattail was prevalent throughout the area in places, with some species, like switchgrass, cocklebur, and rosemallow, more common along the landward edge of the wetland.

There was often a mix of woody species within the emergent wetland in a band along the landward edge. Common tree and shrub species included: black willow (*Salix nigra*), pussy willow (*Salix discolor*), sandbar willow (*Salix interior*), sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), and silky dogwood (*Cornus amomum*).

Non-persistent Emergent/Aquatic Bed Wetlands

Non-persistent emergent/aquatic bed wetlands occur in a few places within the outboard areas (Figures 1 and 2), and total 3.75 acres (Table 1). This cover type occurs in the deeper water portions of the wetlands. It is dominated by a mix of non-persistent emergent and floating aquatic species, with submerged aquatics throughout.

Pickerelweed (*Pontederia cordata*) was the most common non-persistent emergent species in this cover type, with some arrowhead (*Sagittaria latifolia*) in places. Floating aquatics dominated the aquatic bed portion, and the common species were white water lily (*Nymphae*a *odorata*) and yellow water lily (*Nuphar advena*).

Submerged aquatic vegetation is mixed among the emergent and floating aquatic vegetation in this cover type. Common submerged aquatics were: water stargrass (*Heteranthera dubia*), coontail (*Ceratophyllum demersum*), tapegrass (*Vallisneria americana*), waterweed (*Elodea canadensis*), water milfoil *(Myriophyllum* sp.) and sago pondweed (*Stukenia pectinata*). It should be noted that these submerged aquatics are dense in the shallow water on the lakeward edge of the outboard areas well beyond the limits of the delineated wetland areas.

Scrub-Shrub/Young Forested Wetland

There is one area of scrub-shrub/young-forested wetland in the outboard area (Figure 1), and it covers 1.32 acres (Table 1). Silver maple (*Acer saccharinum*), sycamore, and black willow are the most common tree species, although several others were noted. They are about 15 to 20 feet in height. Shrubs in this cover type included silky dogwood and several shrub willows. Persistent emergent wetland plants are common among the woody species and add to the dense cover of this habitat type.

Adjacent Upland Slope

Along the landward edge of the surveyed wetlands there is a well vegetated upland slope. A mix of herbaceous species occur on these slopes, with Indian grass (*Sorgastrum nutans*), big bluestem (*Andropogon gerardii*), and goldenrods (*Solidago* spp.) common. Trees and shrubs were also common, including eastern cottonwood, trembling aspen (*Populus tremuloides*), and black locust (*Robinia pseudoacacia*).

General Vegetation Cover

Based on visual observations during the survey, general vegetation cover throughout the different communities is 95% to 100%, with most areas at 100%.

Invasive Species

Invasive species are very infrequent in the outboard areas. Total cover of invasive species is less than 1%. There is an occasional stem of purple loosestrife (*Lythrum salicaria*) in the emergent wetlands.

Wildlife Usage

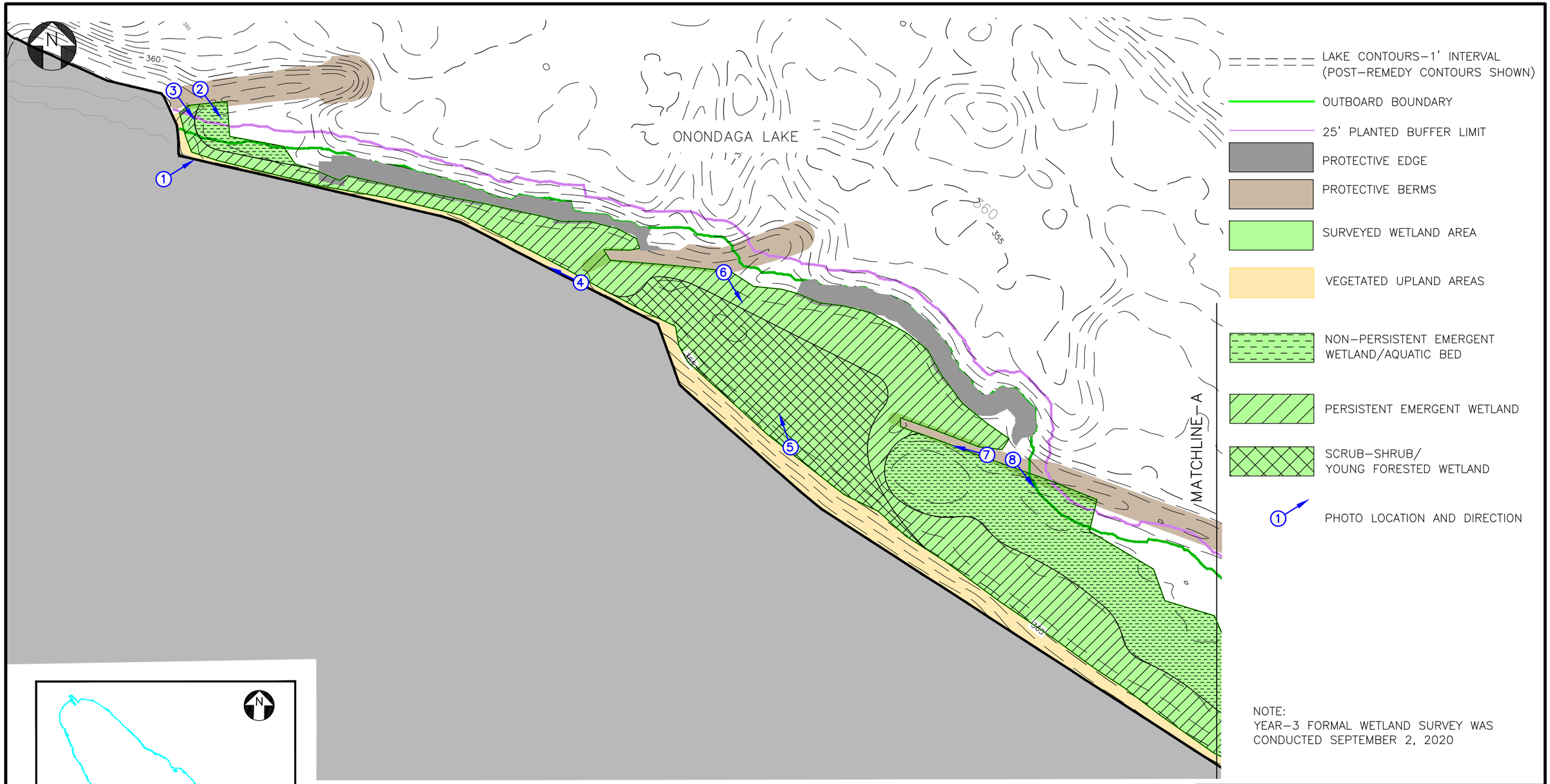
The outboard area wetlands are an area of tremendous wildlife usage, particularly for many different bird guilds. Numerous waterfowl (puddle ducks, diving ducks, geese, etc.), wading birds (great blue heron, great egret, green heron), shorebirds (spotted sandpipers, yellowlegs, plovers, etc.), and raptors (bald eagle and osprey) are often seen in the area. During the September survey, a northern water snake and pickerel frogs were observed. Aquatic mammals, particularly muskrat, are found in the area. The vegetation cover present in the wetlands, especially in the non-persistent/aquatic bed habitat type, also offers excellent sheltering habitat for a variety of young-of-year fish species.

Literature Cited

Weldy, T., D. Werier, and A. Nelson. 2020. New York Flora Atlas. (original application development by S. Landry and K. Campbell, USF Water Institute, Univ. of South Florida). New York Flora Association, Albany, NY.

Table 1
Acreage of Vegetation Cover Types,
Wastebed B/Harbor Brook Outboard Areas,
Town of Geddes, Onondaga County, New York

Wetland Cover Type	Outboard Areas (acres)
Persistent Emergent	5.73
Non-persistent Emergent/ Aquatic Bed	3.75
Scrub-shrub/Young Forested	1.32
Totals	**10.80**



NOTE:
YEAR–3 FORMAL WETLAND SURVEY WAS CONDUCTED SEPTEMBER 2, 2020



KEY PLAN
NOT TO SCALE

150 0 150 300

SCALE: 1"=150'

FIGURE 1

Honeywell ONONDAGA LAKE
SYRACUSE, NEW YORK

WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA YEAR 3 FORMAL WETLAND SURVEY 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\450704 2017–2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\FOCUS–2020\3–YR–09–2020–REV1.DWG
PLOT DATE: 1/5/2022 9:43 AM PLOTTED BY: RUSSO, JILL [US–US]

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ONONDAGA LAKE

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360

MATCHLINE – A

HARBOR BROOK

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10

11

12

LAKE CONTOURS – 1' INTERVAL
(POST–REMEDY CONTOURS SHOWN)

OUTBOARD BOUNDARY

25' PLANTED BUFFER LIMIT

PROTECTIVE EDGE

PROTECTIVE BERMS

SURVEYED WETLAND AREA

VEGETATED UPLAND AREAS

NON–PERSISTENT EMERGENT
WETLAND/AQUATIC BED

PERSISTENT EMERGENT WETLAND

SCRUB–SHRUB/
YOUNG FORESTED WETLAND

PHOTO LOCATION AND DIRECTION

NOTE:
YEAR–3 FORMAL WETLAND SURVEY WAS
CONDUCTED SEPTEMBER 2, 2020



KEY PLAN
NOT TO SCALE

150 0 150 300

SCALE: 1"=150'

FIGURE 2

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

EASTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA YEAR 3 FORMAL WETLAND SURVEY 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\450704 2017–2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\FOCUS–2020\3–YR–09–2020–REV1.DWG
PLOT DATE: 1/5/2022 9:44 AM PLOTTED BY: RUSSO, JILL [US–US]



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12

APPENDIX 2D – MACROPHYTE SURVEY DATA

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
1	N	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	N	0	2	1	0	0	0	0	0	0	0	0	1	0	0	0	2	0	1	0	0
6	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8	N	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
9	N	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
11	N	0	2	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0
13	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
17	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0
18	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	N	0	3	1	0	0	1	0	0	0	0	0	0	1	0	0	3	0	0	0	0
21	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	N	0	3	1	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0
25	N	0	2	1	0	0	1	0	1	0	0	1	2	0	0	0	1	0	0	0	0
27	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
29	N	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	N	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
34	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
36	N	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
38	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
47	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
49	N	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
50	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	N	0	2	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0
58	N	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
60	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	N	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
64	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	N	0	3	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0
68	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
70	N	0	2	1	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0
72	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
75	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
80	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	N	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
83	Y	0	3	1	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0
85	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	Y	0	1	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
90	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	Y	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	N	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0
100	Y	0	3	1	0	1	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0
102	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
105	Y	0	3	1	0	0	1	0	0	0	1	1	1	0	0	0	2	0	0	0	0
107	Y	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
109	N	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	Y	0	3	0	0	0	2	0	0	0	0	0	3	0	0	0	1	0	0	0	0
113	Y	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
114	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
116	Y	0	3	1	0	0	1	0	0	0	0	1	2	0	0	0	0	0	0	1	0
118	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
122	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	N	0	2	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
131	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
132	N	0	2	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
134	N	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	N	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
137	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
139	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
143	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	N	0	3	2	0	0	2	0	1	0	0	0	1	0	0	0	0	0	0	1	0
147	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
149	N	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152	N	0	3	0	0	0	0	0	1	0	1	1	3	0	0	0	1	0	0	0	0
158	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
160	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
161	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
163	N	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
164	Y	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
166	N	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
169	Y	0	2	0	0	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
170	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	Y	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	N	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0
179	N	0	3	1	0	1	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0
181	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
182	N	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
184	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
185	N	0	2	1	0	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0
187	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
191	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
192	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
194	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
195	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
196	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
198	Y	0	2	1	0	1	1	0	1	1	1	0	1	1	0	0	1	0	0	0	0
199	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
201	N	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
204	Y	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
207	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
208	Y	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
209	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
212	N	0	3	0	0	0	0	0	0	1	0	1	0	0	0	0	3	0	0	0	0
213	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
214	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
218	Y	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
219	Y	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
221	N	0	3	0	0	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0
222	N	0	2	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0
223	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
224	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
228	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
229	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
231	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
232	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
239	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	N	0	2	0	0	0	1	0	0	0	1	0	2	0	0	0	0	0	0	0	0
241	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
242	Y	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
244	N	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
247	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
251	N	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
253	Y	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
256	N	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
257	N	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
258	Y	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
260	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
262	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
263	Y	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
265	Y	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
268	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
269	Y	0	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
271	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
273	N	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
274	Y	0	2	1	0	0	0	0	0	0	1	0	0	0	1	0	2	0	0	0	0
276	Y	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
278	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
279	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
282	Y	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
284	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
289	Y	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
291	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
293	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
294	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
297	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
299	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
302	N	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
305	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
307	Y	0	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
311	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
312	N	0	3	2	0	0	2	0	0	0	2	1	0	1	0	0	0	0	0	0	0
316	Y	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
317	Y	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
318	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
321	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
322	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
325	Y	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
327	Y	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
329	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
332	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
334	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337	N	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
338	N	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0
339	N	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
341	Y	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
343	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
344	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
346	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
348	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
353	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
354	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
355	N	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
357	N	0	2	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
359	Y	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
362	Y	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
364	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
366	Y	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
368	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

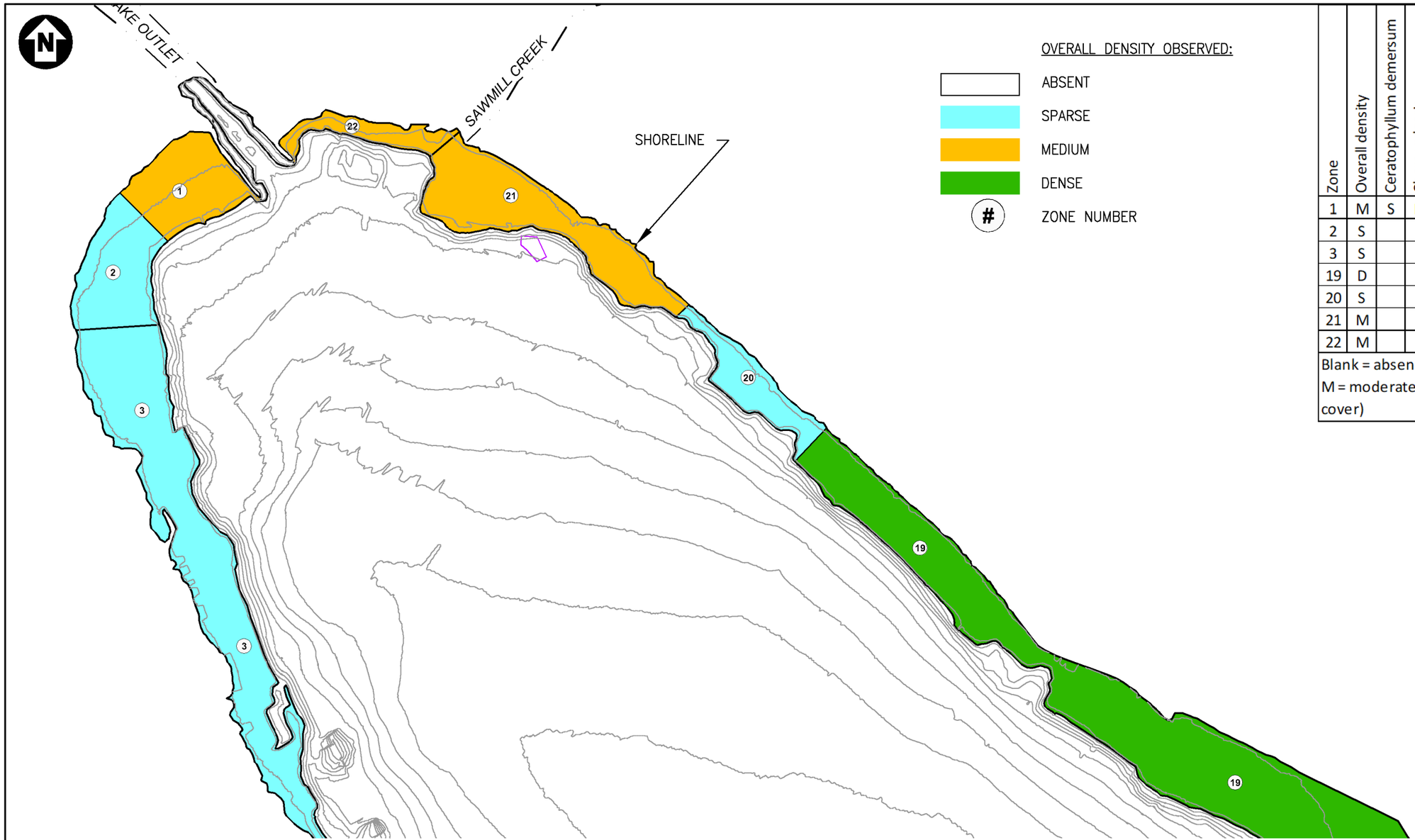
Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
369	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
373	N	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0
374	Y	0	3	1	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0
375	Y	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
377	Y	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379	Y	0	2	1	0	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0
381	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
384	N	0	2	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
385	N	0	2	1	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0
387	Y	0	2	0	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0
389	Y	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
391	Y	0	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
393	N	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
394	N	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
396	N	0	3	2	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
CSX-1	N	0	3	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CSX-2	N	0	2	1	0	1	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0
CSX-3	N	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CSX-4	N	0	3	2	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
CSX-5	N	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CSX-6	N	0	2	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
CSX-7	N	0	2	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
CSX-8	N	0	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CSX-9	N	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
CSX-10	N	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
CSX-11	N	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
CSX-12	N	0	3	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
CSX-13	N	0	2	1	0	1	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0

TABLE 2D.1 2020 MACROPHYTE QUANTITATIVE SURVEY DATA (CONTINUED)

Point number	Remediation area	Water depth (m)	Biomass	Species																
				Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
CSX-14	N	0	2	0	0	1	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0
CSX-15	N	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CSX-16	N	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
CSX-17	N	0	2	1	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
CSX-18	N	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
NEW-1	Y	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW-2	Y	0	2	1	0	1	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
NEW-3	Y	0	3	1	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0
NEW-4	Y	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW-5	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW-6	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW-7	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2D.2 2020 QUANTITATIVE MACROPHYTE SURVEY SUMMARY

	Average Biomass per Species																			
	Number of points	Average overall biomiass	Ceratophyllum demersum (Coontail)	Chara vulgaris (Common stonewort)	Elodea canadensis (Common waterweed)	Heteranthera dubia (Water stargrass)	Lemna minor (Common duckweed)	Myriophyllum sibiricum (Northern watermilfoil)	Myriophyllum spicatum (Eurasian watermilfoil)	Najas guadalupensis (Guadalupe water nymph)	Najas sp. (Water nymph)	Nitellopsis obtusa (Starry stonewort)	Potamogeton crispus (Curly pondweed)	Potamogeton illinoiensis (Illinois pondweed)	Spirodela polyrhiza (Common duckmeat)	Stuckenia pectinata (Sago pondweed)	Unknown	Utricularia sp. (Bladderwort)	Vallisneria americana (American eelgrass)	Zizania aquatica (Wild rice)
Unremediated	136	1.46	0.29	0.04	0.19	0.17	0.03	0.08	0.06	0.05	0.04	0.84	0.04	0.00	0.01	0.38	0.01	0.01	0.02	0.01
Remediated	100	0.80	0.38	0.00	0.23	0.36	0.00	0.07	0.01	0.07	0.05	0.10	0.02	0.01	0.00	0.13	0.00	0.00	0.03	0.00



Zone	Overall density	Ceratophyllum demersum	Chara vulgaris	Heteranthera dubia	Myriophyllum sp.	Nitellopsis obtusa	Nymphaea odorata	Potamogeton crispus	Stuckenia pectinata	Trapa natans	Vallisneria americana	Zizania aquatica
1	M	S	M				S	M	S			S
2	S						S		S			S
3	S				S	S		S	S			
19	D					D			S			
20	S					S			S			
21	M				S	M		S	S			
22	M			S				M	M			

Blank = absent (0% cover), S = sparse (1-25% cover), M = moderate (26-75% cover), D = dense (76-100% cover)

AREA OBSERVED

REMEDIATION AREA BOUNDARY

CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. OBSERVATIONS ARE TO APPROXIMATELY 7FT DEPTH; SEE REPORT DETAILS.

800 400 0 800 1600

SCALE: 1"=800'

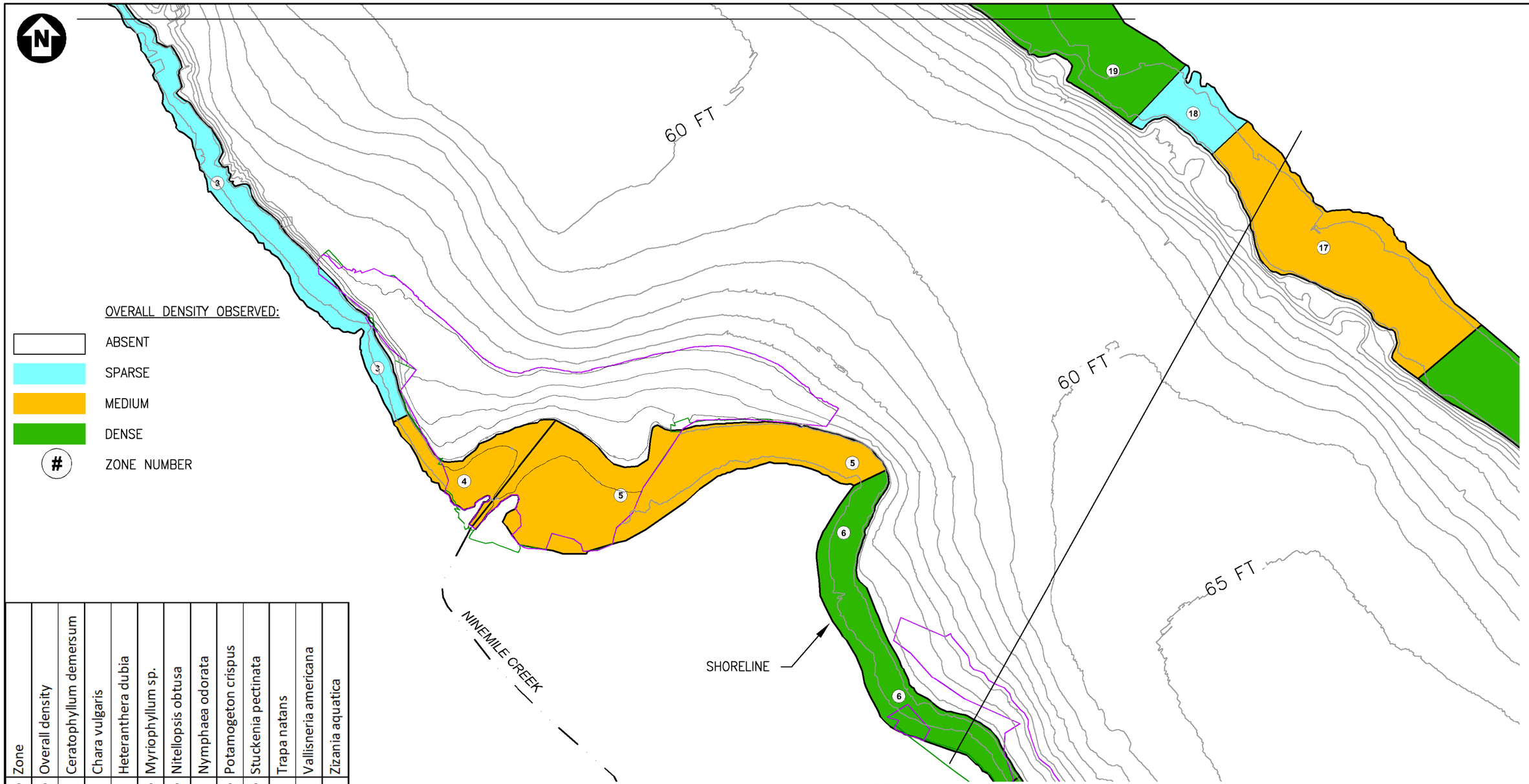
FIGURE 2D.1

Honeywell ONONDAGA LAKE SYRACUSE, NEW YORK

QUALITATIVE MACROPHYTE SURVEY
NORTH END
JUNE 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2020\450102-M-PHYTE-JUNE-2020.DWG
PLOT DATE: 1/25/2021 10:40 AM PLOTTED BY: RUSSO, JILL



Zone	Overall density	Ceratophyllum demersum	Chara vulgaris	Heteranthera dubia	Myriophyllum sp.	Nitellopsis obtusa	Nymphaea odorata	Potamogeton crispus	Stuckenia pectinata	Trapa natans	Vallisneria americana	Zizania aquatica
3	S				S	S		S	S			
4	M								M			
5	M	S						M	M	S		
6	D							M	D			
17	M					M			S			
18	S					S						
19	D					D			S			

Blank = absent (0% cover), S = sparse (1-25% cover), M = moderate (26-75% cover), D = dense (76-100% cover)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. OBSERVATIONS ARE TO APPROXIMATELY 7FT DEPTH; SEE REPORT DETAILS.

800 400 0 800 1600

SCALE: 1"=800'

FIGURE 2D.2

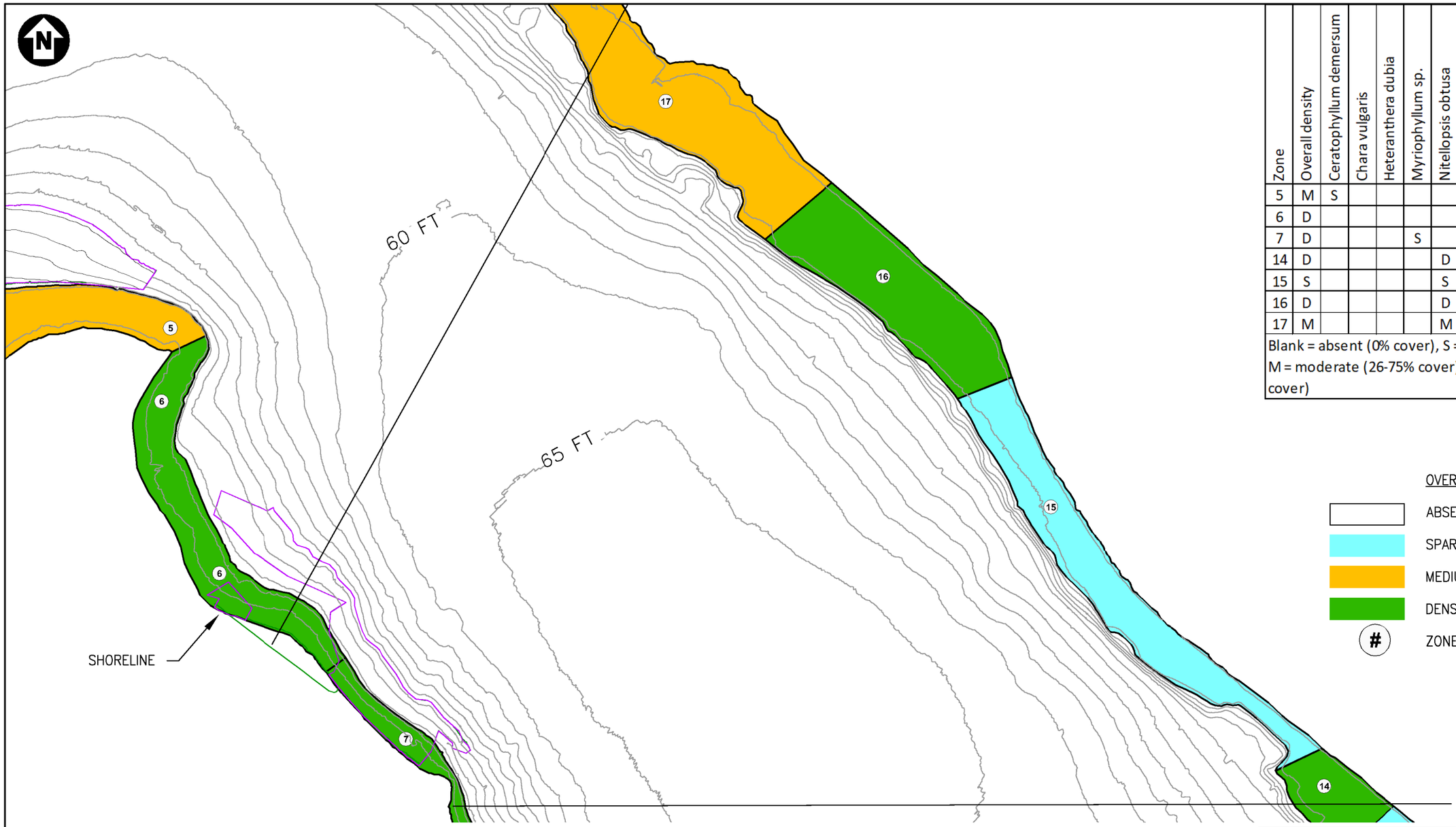
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

QUALITATIVE MACROPHYTE SURVEY
NORTH MIDDLE
JUNE 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2020\450102-M-PHYTE-JUNE-2020.DWG
PLOT DATE: 1/25/2021 10:50 AM PLOTTED BY: RUSSO, JILL



Zone	Overall density	Ceratophyllum demersum	Chara vulgaris	Heteranthera dubia	Myriophyllum sp.	Nitellopsis obtusa	Nymphaea odorata	Potamogeton crispus	Stuckenia pectinata	Trapa natans	Vallisneria americana	Zizania aquatica
5	M	S						M	M	S		
6	D							M	D			
7	D				S			M	M			
14	D					D			S			
15	S					S			S			
16	D					D						
17	M					M			S			

Blank = absent (0% cover), S = sparse (1-25% cover), M = moderate (26-75% cover), D = dense (76-100% cover)

OVERALL DENSITY OBSERVED:

- ABSENT
- SPARSE
- MEDIUM
- DENSE
- # ZONE NUMBER

- AREA OBSERVED
- REMEDIATION AREA BOUNDARY
- CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. OBSERVATIONS ARE TO APPROXIMATELY 7FT DEPTH; SEE REPORT DETAILS.

800 400 0 800 1600

SCALE: 1"=800'

FIGURE 2D.3

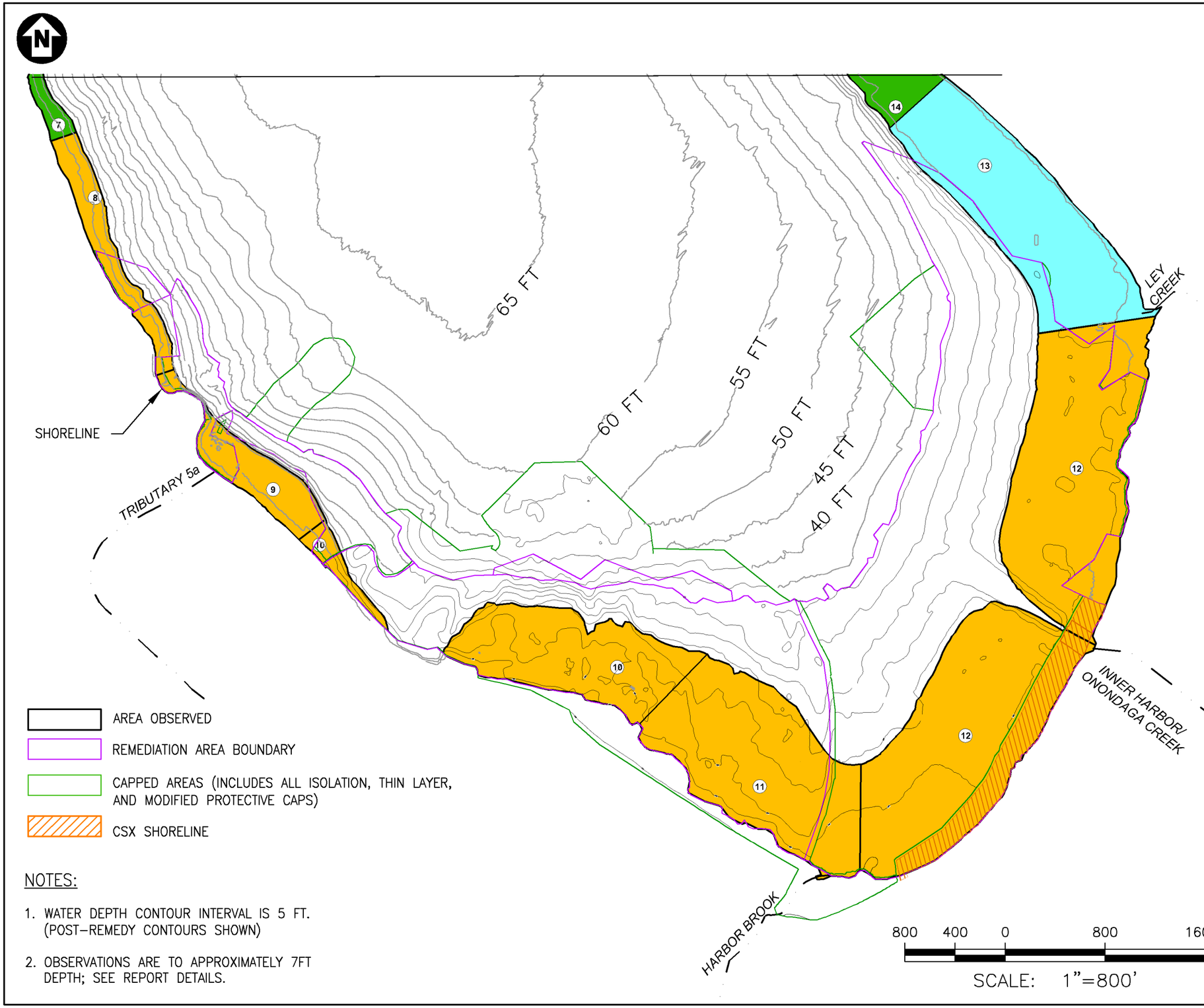
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

QUALITATIVE MACROPHYTE SURVEY
SOUTH MIDDLE
JUNE 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2020\450102-M-PHYTE-JUNE-2020.DWG
PLOT DATE: 1/25/2021 10:56 AM PLOTTED BY: RUSSO, JILL



Zone	Overall density	Ceratophyllum demersum	Chara vulgaris	Heteranthera dubia	Myriophyllum sp.	Nitellopsis obtusa	Nymphaea odorata	Potamogeton crispus	Stuckenia pectinata	Trapa natans	Vallisneria americana	Zizania aquatica
7	D				S			M	M			
8	M			S		S		M	M			
9	M			S	S			M	M			
10	M				S	S		M	M			
11	M							S	S			
12	M			S	S		S	M	M		S	S
13	S								S			
14	D					D			S			

Blank = absent (0% cover), S = sparse (1-25% cover), M = moderate (26-75% cover), D = dense (76-100% cover)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. OBSERVATIONS ARE TO APPROXIMATELY 7FT DEPTH; SEE REPORT DETAILS.

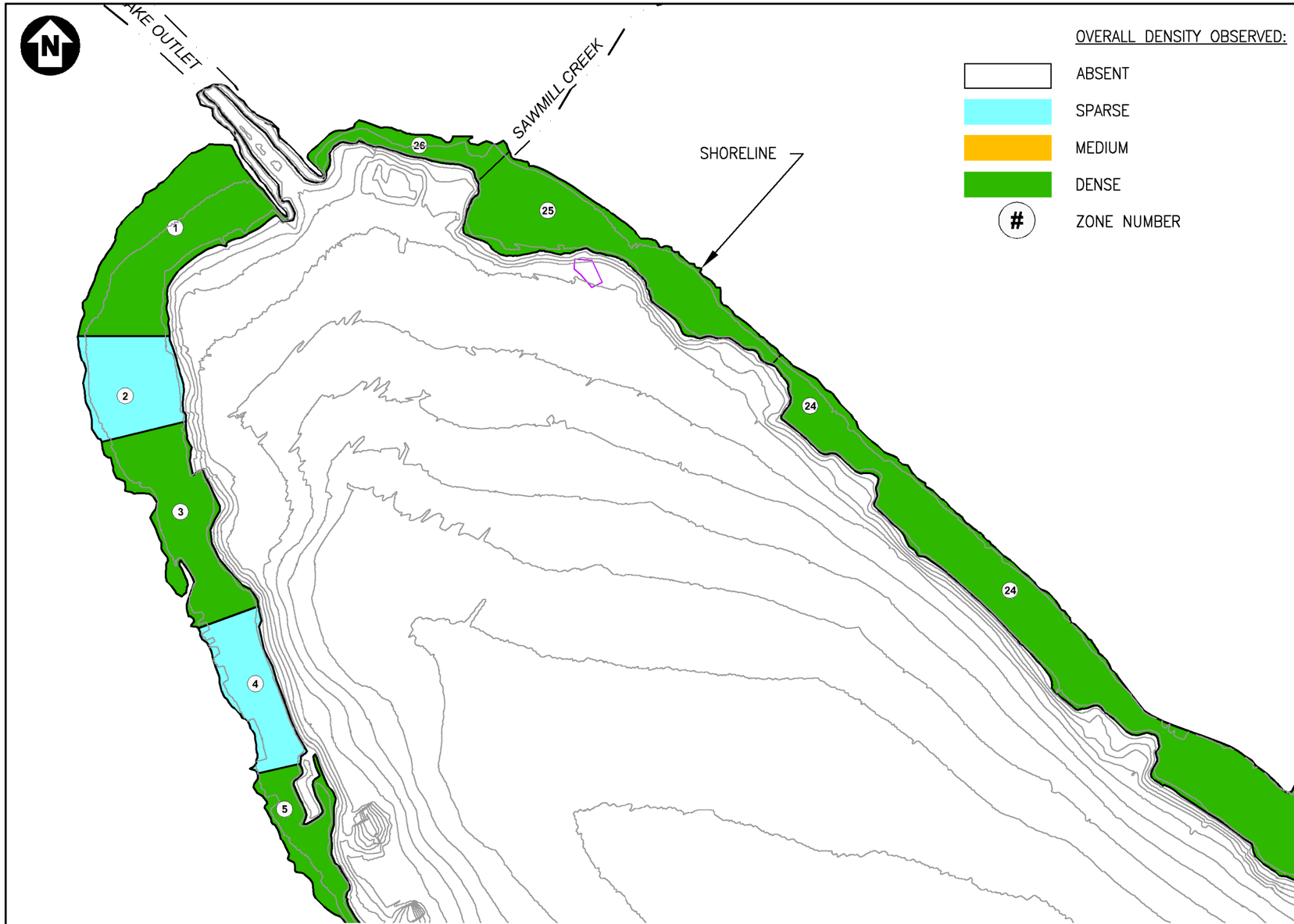
FIGURE 2D.4

Honeywell — ONONDAGA LAKE, SYRACUSE, NEW YORK

QUALITATIVE MACROPHYTE SURVEY
SOUTH END
JUNE 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2020\450102-M-PHYTE-JUNE-2020.DWG
PLOT DATE: 1/25/2021 11:46 AM PLOTTED BY: RUSSO, JILL



Zone	Overall density	Ceratophyllum demersum	Elodea canadensis	Heteranthera dubia	Myriophyllum sp.	Myriophyllum spicatum	Najas sp.	Nitellopsis obtusa	Potamogeton crispus	Potamogeton illinoiensis	Stuckenia pectinata	Utricularia sp.	Vallisneria americana	Zizania aquatica
1	D	S						D			D	S		S
2	S	S									S			S
3	D	S						D	S		M	S		S
4	S							S			S			
5	D						S	D	S		S	S		
24	D			S				D			S		S	
25	D			S	S			D			S		S	
26	D	S		M	S			D	S		S			

Blank = absent (0% cover), S = sparse (1-25% cover),
M = moderate (26-75% cover), D = dense (76-100% cover)

AREA OBSERVED

REMEDIATION AREA BOUNDARY

CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. OBSERVATIONS ARE TO APPROXIMATELY 7FT DEPTH; SEE REPORT DETAILS.

800 400 0 800 1600

SCALE: 1"=800'

FIGURE 2D.5

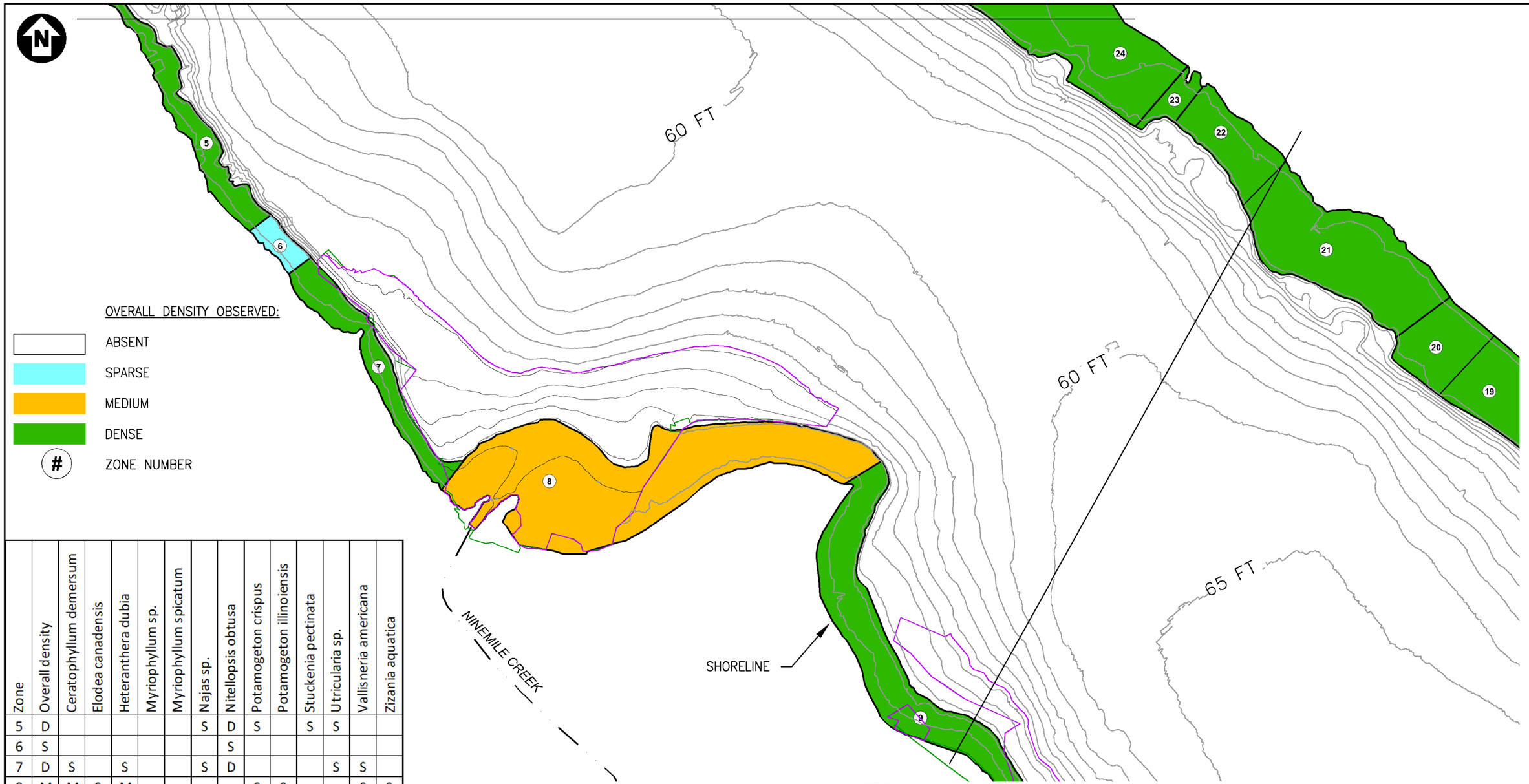
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

QUALITATIVE MACROPHYTE SURVEY
NORTH END
AUGUST 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2020\450102-M-PHYTE-AUGUST-2020.DWG
PLOT DATE: 1/25/2021 11:19 AM PLOTTED BY: RUSSO, JILL



Zone	Overall density	Ceratophyllum demersum	Elodea canadensis	Heteranthera dubia	Myriophyllum sp.	Myriophyllum spicatum	Najas sp.	Nitellopsis obtusa	Potamogeton crispus	Potamogeton illinoiensis	Stuckenia pectinata	Utricularia sp.	Vallisneria americana	Zizania aquatica
5	D						S	D	S		S	S		
6	S							S						
7	D	S		S			S	D				S	S	
8	M	M	S	M					S	S			S	S
9	D			S				D			S	S		
19	D	S		S	S			D	S		S			
20	D										D			
21	D			S	S			D			S			
22	D	S						D			M		S	
23	D				S			D			S			
24	D			S				D			S		S	

Blank = absent (0% cover), S = sparse (1-25% cover),
M = moderate (26-75% cover), D = dense (76-100% cover)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. OBSERVATIONS ARE TO APPROXIMATELY 7FT DEPTH; SEE REPORT DETAILS.

800 400 0 800 1600

SCALE: 1"=800'

FIGURE 2D.6

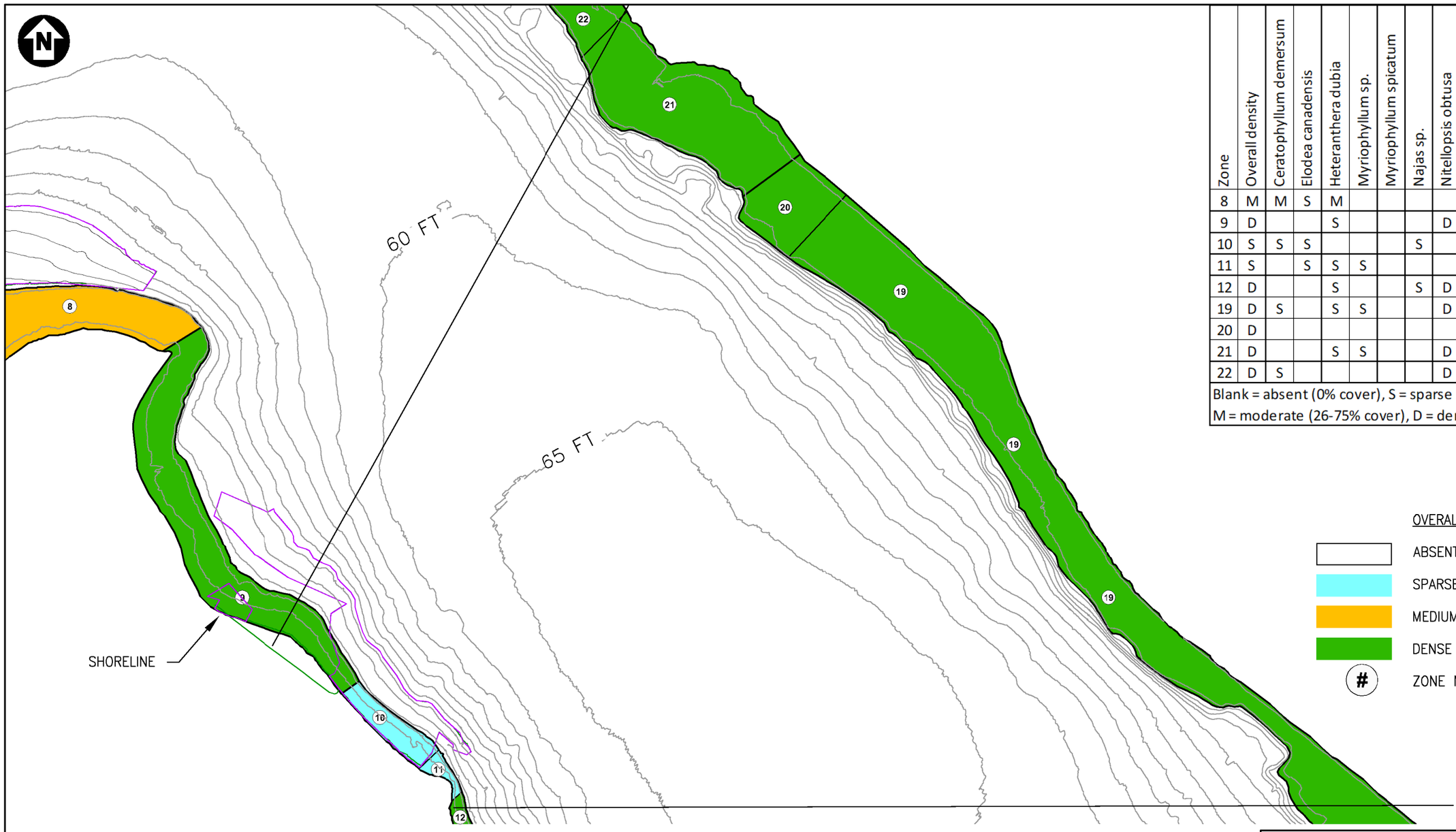
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

QUALITATIVE MACROPHYTE SURVEY
NORTH MIDDLE
AUGUST 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2020\450102-M-PHYTE-AUGUST-2020.DWG
PLOT DATE: 1/25/2021 11:25 AM PLOTTED BY: RUSSO, JILL



Zone	Overall density	Ceratophyllum demersum	Elodea canadensis	Heteranthera dubia	Myriophyllum sp.	Myriophyllum spicatum	Najas sp.	Nitellopsis obtusa	Potamogeton crispus	Potamogeton illinoiensis	Stuckenia pectinata	Utricularia sp.	Vallisneria americana	Zizania aquatica
8	M	M	S	M					S	S			S	S
9	D			S				D			S	S		
10	S	S	S				S							S
11	S		S	S	S									
12	D			S			S	D						
19	D	S		S	S			D	S		S			
20	D										D			
21	D			S	S			D			S			
22	D	S						D			M		S	

Blank = absent (0% cover), S = sparse (1-25% cover),
M = moderate (26-75% cover), D = dense (76-100% cover)

OVERALL DENSITY OBSERVED:

- ABSENT
- SPARSE
- MEDIUM
- DENSE
- # ZONE NUMBER

- AREA OBSERVED
- REMEDIATION AREA BOUNDARY
- CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. OBSERVATIONS ARE TO APPROXIMATELY 7FT DEPTH; SEE REPORT DETAILS.

800 400 0 800 1600

SCALE: 1"=800'

FIGURE 2D.7

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

QUALITATIVE MACROPHYTE SURVEY
SOUTH MIDDLE
AUGUST 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2020\450102-M-PHYTE-AUGUST-2020.DWG
PLOT DATE: 1/25/2021 11:32 AM PLOTTED BY: RUSSO, JILL

Zone	Overall density	Ceratophyllum demersum	Elodea canadensis	Heteranthera dubia	Myriophyllum sp.	Myriophyllum spicatum	Najas sp.	Nitellopsis obtusa	Potamogeton crispus	Potamogeton illinoiensis	Stuckenia pectinata	Utricularia sp.	Vallisneria americana	Zizania aquatica
12	D			S			S	D						
13	S	S		S							S		S	
14	D							D						
15	S		S	S							S		S	
16	D			S				D	S					
17	D		S				S	D						
18	M	S		S	S	S					S		S	
19	D	S		S	S			D	S		S			

Blank = absent (0% cover), S = sparse (1-25% cover),
M = moderate (26-75% cover), D = dense (76-100% cover)

65 FT
60 FT
55 FT
50 FT
45 FT
40 FT

SHORELINE
TRIBUTARY 5a
LEY CREEK
INNER HARBOR/ ONONDAGA CREEK
HARBOR BROOK

AREA OBSERVED
REMEDIATION AREA BOUNDARY
CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)
CSX SHORELINE

OVERALL DENSITY OBSERVED:
ABSENT
SPARSE
MEDIUM
DENSE
ZONE NUMBER

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. OBSERVATIONS ARE TO APPROXIMATELY 7FT DEPTH; SEE REPORT DETAILS.

800 400 0 800 1600
SCALE: 1"=800'

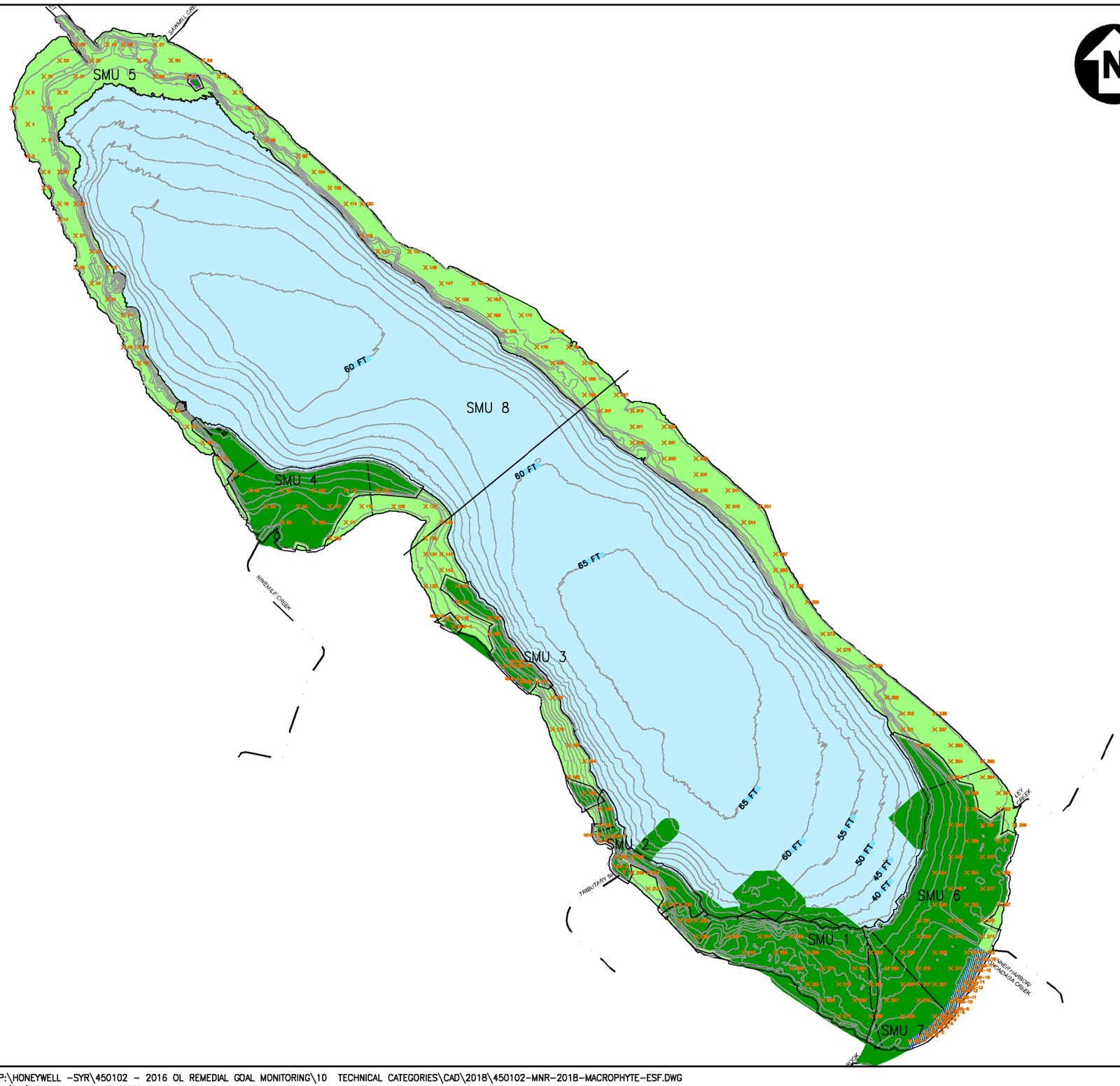
FIGURE 2D.8

Honeywell
ONONDAGA LAKE
SYRACUSE, NEW YORK

QUALITATIVE MACROPHYTE SURVEY
SOUTH END
AUGUST 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2020\450102-M-PHYTE-AUGUST-2020.DWG
PLOT DATE: 1/25/2021 11:48 AM PLOTTED BY: RUSSO, JILL



X MACROPHYTE SAMPLING LOCATIONS

REMEDIATION AREA BOUNDARY

SMU BOUNDARY

SMU 8

LITTORAL ZONE

CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

CSX SHORELINE

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)

2000 1000 0 2000 4000

SCALE: 1"=2000'

FIGURE 2D.9

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

MACROPHYTE SAMPLING LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2018\450102-MNR-2018-MACROPHYTE-ESF.DWG
PLOT DATE: 6/29/2020 9:16 AM PLOTTED BY: RUSSO, JILL

APPENDIX 2E – FISH AND WILDLIFE DATA

TABLE 2E.1 2020 FISH MONITORING USING GILL NETS[1]

Common Name	Scientific Name	690 Point	Harbor Brook	Hiawatha	Iron Bridge	Ley Creek	Marina	Metro	Ninemile	Outlet	Parsons	PHM	Wastebeds	Total
Alewife	*Alosa pseudoharengus*		1											**1**
Bowfin	*Amia calva*											1	1	**2**
Brown Bullhead	*Ameiurus nebulosus*			2					1			2		**5**
Brown Trout	*Salmo trutta*						2				2			**4**
Channel Catfish	*Ictalurus punctatus*	6	4	3	1	4		6	8	1	2	5	3	**43**
Common Carp	*Cyprinus carpio*	8	2	7	5	2	6	10	11	8	6	8	1	**74**
Common Rudd	*Scardinius erythrophthalmus*			1		2			1			1		**5**
Freshwater Drum	*Aplodinotus grunniens*	9	1	6	8	5	14	3	1	8	2	20	1	**78**
Gizzard Shad	*Dorosoma cepedianum*	11	48	17	4	23	9	25	31	13	8	6	20	**215**
Greater Redhorse	*Moxostoma valenciennesi*		2	2	2	1	3		2			3	1	**16**
Largemouth Bass	*Micropterus salmoides*	1	2	1	2		1	1	2	6		4	1	**21**
Longnose Gar	*Lepisosteus osseus*									1				**1**
Northern Pike	*Esox lucius*	1		2									1	**4**
Quillback	*Carpiodes cyprinus*									1		1		**2**
Shorthead Redhorse	*Moxostoma macrolepidotum*		1	1			1	1		1	1	1	1	**8**
Smallmouth Bass	*Micropterus dolomieu*	3	2	3	2	5	6	5	5	2		3	1	**37**
Walleye	*Sander vitreus*	31	23	25	9	16	31	37	13	19	8	51	16	**279**
White Perch	*Morone americana*	1	1			1	1		1					**5**
White Sucker	*Catostomus commersonii*	1	1		1	2	2	1	1		1			**10**
	Abundance	**72**	**88**	**70**	**34**	**61**	**76**	**89**	**77**	**60**	**30**	**106**	**47**	**810**
	Species Richness	**10**	**12**	**12**	**9**	**10**	**11**	**9**	**12**	**10**	**8**	**13**	**11**	**19**

[1]A map depicting fish sampling locations can be found in Figure 2.4

TABLE 2E.2 2020 FISH MONITORING USING TRAP NETS[1]

Common Name	Scientific Name	690 Point	Harbor Brook	Iron Bridge	Ley Creek	Maple Bay	Marina	Metro	Ninemile	Parsons	PHM	Willow Bay	Total
Alewife	*Alosa pseudoharengus*	83	16	269	261	67	91	5		14	49	63	**918**
Banded Killifish	*Fundulus diaphanus*	54	190	124	215	181	363	532	1343	113	116	441	**3672**
Bluegill	*Lepomis macrochirus*	32	160	170	358	16	57	30	94	117	40	325	**1399**
Bluntnose Minnow	*Pimephales notatus*					4	1					56	**61**
Bowfin	*Amia calva*		1		5	1		1	6			3	**17**
Brook Silverside	*Labidesthes sicculus*					1							**1**
Brook Stickleback	*Culaea inconstans*				2			1	1				**4**
Brown Bullhead	*Ameiurus nebulosus*	1	8	1	10	5	9	20	5	3	1	3	**66**
Channel Catfish	*Ictalurus punctatus*		1					1		1			**3**
Common Carp	*Cyprinus carpio*	1		4	5			2	7			1	**20**
Common Rudd	*Scardinius erythrophthalmus*		4					1	1				**6**
Common Shiner	*Luxilus cornutus*							4					**4**
Creek Chub	*Semotilus atromaculatus*				1								**1**
Emerald Shiner	*Notropis atherinoides*				3			8	3			1	**15**
Fathead Minnow	*Pimephales promelas*				1			3				6	**10**
Freshwater Drum	*Aplodinotus grunniens*		1						1				**2**
Gizzard Shad	*Dorosoma cepedianum*		14	2	24	1	2	395		6	3	3	**450**
Golden Shiner	*Notemigonus crysoleucas*	2			3	2	1	3				3	**14**
Green Sunfish	*Lepomis cyanellus*		31	23	12	6	22	50	15	14	2	4	**179**
Largemouth Bass	*Micropterus salmoides*	7	89	113	97	75	45	222	23	35	22	38	**766**
Longnose Gar	*Lepisosteus osseus*									1	1		**2**
Pumpkinseed	*Lepomis gibbosus*	2	5	49	11	4	3	15	2	3	2	9	**105**
Rock Bass	*Ambloplites rupestris*	8	40	30	242	10	37	32	39	16	11	12	**477**
Round Goby	*Neogobius melanostomus*	76	186	517	458	103	344	578	28	188	63	116	**2657**
Smallmouth Bass	*Micropterus dolomieu*					1							**1**
Tadpole Madtom	*Noturus gyrinus*	1										1	**2**
White Perch	*Morone americana*		1	7	4		1	5	1	2	1		**22**
Yellow Bullhead	*Ameiurus natalis*					2			2		5	2	**11**
Yellow Perch	*Perca flavescens*	1		4	3	3	1		4		4		**20**
	Abundance	**268**	**747**	**1313**	**1556**	**482**	**977**	**1908**	**1575**	**513**	**320**	**1087**	**10905**
	Species Richness	**12**	**15**	**13**	**19**	**17**	**14**	**20**	**17**	**13**	**14**	**18**	**29**

[1]A map depicting fish sampling locations can be found in Figure 2.4

TABLE 2E.3 2020 FISH MONITORING USING SEINE NETS[1]

Common Name	Scientific Name	690 Pt	Harbor Brook	Iron Bridge	Ley Creek	Maple Bay	Marina	Metro	Ninemile	Parsons	PHM	Willow Bay	Total
Banded Killifish	*Fundulus diaphanus*	124	5	174	60	338	125	4	116	228	432	63	1669
Bluegill	*Lepomis macrochirus*		8		1				1		10		20
Brown Bullhead	*Ameiurus nebulosus*	53	3		32		2		71	86			247
Common Carp	*Cyprinus carpio*		14	11	3			8	3				39
Emerald Shiner	*Notropis atherinoides*		2										2
Green Sunfish	*Lepomis cyanellus*		9	6	12				1		1		29
Largemouth Bass	*Micropterus salmoides*	61	140	36	35	38	17	43	53	95	84	26	628
Longnose Gar	*Lepisosteus osseus*	1											1
Rock Bass	*Ambloplites rupestris*	42	14	18		6	3	1	42	9	5	151	291
Round Goby	*Neogobius melanostomus*	110	56	130	76	127	26	55	7	42	138	243	1010
Smallmouth Bass	*Micropterus dolomieu*				1			4					5
Tadpole Madtom	*Micropterus dolomieu*	2							2				4
Yellow Bullhead	*Ameiurus natalis*											5	5
Yellow Perch	*Perca flavescens*	2										5	7
Alewife	*Alosa pseudoharengus*											10	10
Gizzard Shad	*Dorosoma cepedianum*				2								2
Brook Silverside	*Labidesthes sicculus*					5							5
	Abundance	**395**	**251**	**375**	**222**	**514**	**173**	**115**	**296**	**460**	**670**	**503**	**3974**
	Species Richness	**8**	**9**	**6**	**9**	**5**	**5**	**6**	**9**	**5**	**6**	**7**	**17**

[1]A map depicting fish sampling locations can be found in Figure 2.4

TABLE 2E.4 FISH MONITORING -
RELATIVE ABUNDANCE BASELINE COMPARISON

Scientific Name	Common Name	Lakewide Baseline (2008-2011)	Lakewide Construction (2012-2016)	Lakewide 2017	Lakewide 2018	Lakewide 2019	Change Lakewide	Lakewide 2020	Remediation Area Baseline (2008-2011)	Remediation Area Construction (2012-2016)	Remediation Area 2017	Remediation Area 2018	Remediation Area 2019
Acipenser fulvescens	Lake Sturgeon	0.03%	0.03%	0.02%	0.004%	-	-	-	0.02%	0.03%	0.02%	0.004%	-
Alosa pseudoharengus	Alewife	5.15%	5.29%	1.86%	2.88%	0.31%	+	5.92%	6.66%	6.19%	2.19%	0.30%	0.38%
Ambloplites rupestris	Rock Bass	1.03%	1.08%	0.98%	1.13%	2.65%	+	4.90%	1.01%	1.53%	0.94%	0.66%	2.59%
Ameiurus natalis	Yellow Bullhead	0.08%	0.03%	0.03%	0.05%	0.24%	-	0.10%	0.03%	0.01%	0.01%	0.01%	0.28%
Ameiurus nebulosus	Brown Bullhead	2.41%	1.88%	4.32%	0.60%	4.08%	-	2.03%	3.07%	2.26%	5.81%	0.52%	2.46%
Amia calva	Bowfin	0.62%	0.41%	0.10%	0.06%	0.15%	-	0.12%	0.75%	0.57%	0.05%	0.04%	0.16%
Aplodinotus grunniens	Freshwater Drum	0.36%	0.38%	0.35%	0.22%	0.31%	+	0.51%	0.50%	0.45%	0.41%	0.18%	0.18%
Carassius auratus	Goldfish	0.42%	0.03%	0.01%	0.004%	-	-	-	0.68%	0.07%	0.01%	0.01%	-
Carpoides cyprinus	Quillback	0.02%	0.01%	0.01%	0.011%	0.02%	-	0.01%	0.02%	-	0.02%	0.01%	0.01%
Catostomus commersonii	White Sucker	0.66%	0.22%	0.07%	0.07%	0.04%	+	0.06%	0.88%	0.36%	0.06%	0.09%	0.03%
Culaea inconstans	Brook Stickleback	0.05%	0.08%	0.003%	-	0.01%	+	0.03%	0.02%	0.03%	0.01%	-	0.02%
Cyprinus carpio	Common Carp	1.26%	0.99%	0.46%	0.61%	1.61%	-	0.85%	1.32%	1.05%	0.43%	0.43%	0.84%
Dorosoma cepedianum	Gizzard Shad	2.40%	1.06%	0.80%	27.04%	2.22%	-	4.25%	4.25%	1.84%	1.11%	45.85%	3.63%
Esox masquinongy x Esox lucius	Tiger Muskellunge	0.03%	0.05%	0.01%	-	0.01%	-	-	0.01%	0.06%	0.01%	-	0.01%
Esox niger	Chain Pickerel	0.002%	-	0.003%	-	-	-	-	0.02%	0.03%	-	-	-
Esox lucius	Northern Pike	0.06%	0.07%	0.03%	0.02%	0.02%	+	0.03%	0.11%	-	0.01%	0.02%	0.02%
Etheostoma olmstedi	Tesselated Darter	0.30%	0.09%	0.003%	0.002%	0.004%	-	-	0.11%	0.07%	0.01%	0.004%	-
Fundulus diaphanus	Banded Killifish	32.37%	44.13%	36.46%	36.56%	37.11%	-	34.04%	24.03%	34.28%	29.53%	30.28%	40.90%
Ictalurus punctatus	Channel Catfish	0.67%	0.31%	0.10%	0.13%	0.16%	+	0.29%	0.88%	0.45%	0.12%	0.07%	0.21%
Labidesthes sicculus	Brook Silverside	0.19%	0.07%	0.05%	0.009%	0.01%	+	0.04%	0.34%	0.07%	0.02%	0.004%	0.01%
Lepisosteus osseus	Longnose Gar	0.39%	0.18%	0.01%	0.02%	0.06%	-	0.03%	0.57%	0.31%	0.02%	0.01%	0.05%
Lepomis cyanellus	Green Sunfish	0.19%	0.37%	1.50%	0.43%	1.54%	-	1.33%	0.12%	0.25%	1.67%	0.40%	2.14%
Lepomis gibbosus	Pumpkinseed	8.85%	2.57%	0.98%	0.60%	0.38%	+	0.67%	8.80%	1.92%	0.59%	0.43%	0.40%
Lepomis macrochirus	Bluegill	13.86%	12.12%	12.27%	7.87%	20.32%	-	9.04%	12.54%	13.49%	7.51%	2.79%	17.86%
Micropterus dolomieu	Smallmouth Bass	0.34%	0.26%	0.13%	0.15%	0.11%	+	0.27%	0.27%	0.25%	0.12%	0.13%	0.11%
Micropterus salmoides	Largemouth Bass	13.12%	14.29%	22.53%	14.26%	15.35%	-	9.02%	14.97%	16.55%	31.08%	12.32%	16.01%
Morone americana	White Perch	1.67%	1.02%	0.22%	0.40%	0.17%	-	0.17%	2.82%	3.14%	0.23%	0.62%	0.26%
Moxostoma anisurum	Silver Redhorse	0.03%	0.01%	0.01%	-	0.004%	-	-	0.02%	0.01%	0.02%	-	-
Moxostoma macrolepidotum	Shorthead Redhorse	0.15%	0.08%	0.06%	0.02%	0.03%	+	0.05%	0.18%	0.07%	0.07%	0.01%	0.03%
Neogobius melanostomus	Round Goby	3.30%	6.29%	12.32%	4.31%	10.99%	+	23.37%	2.57%	6.15%	14.15%	3.08%	9.55%
Notemigonus crysoleucas	Golden Shiner	1.85%	0.72%	0.33%	0.17%	0.18%	-	0.09%	2.25%	0.66%	0.34%	0.17%	0.30%
Notropis atherinoides	Emerald Shiner	0.15%	0.24%	0.07%	0.60%	0.09%	+	0.11%	0.17%	0.32%	0.08%	0.43%	0.13%
Noturus gyrinus	Tadpole Madtom	0.06%	0.10%	0.09%	0.01%	0.05%	-	0.04%	0.08%	0.17%	0.03%	0.01%	0.08%
Noturus insignis	Margined Madtom	-	-	0.003%	0.01%	0.01%	-	-	-	-	0.01%	-	-
Perca flavescens	Yellow Perch	1.65%	1.26%	2.46%	0.97%	0.53%	-	0.17%	1.49%	1.38%	1.84%	0.53%	0.17%
Pimephales notatus	Bluntnose Minnow	0.23%	0.36%	0.67%	0.11%	0.03%	+	0.39%	0.25%	0.46%	0.85%	0.05%	0.01%
Pomoxis nigromaculatus	Black Crappie	0.16%	0.04%	0.02%	0.01%	0.02%	-	-	0.04%	0.01%	0.01%	-	0.03%
Salmo trutta	Brown Trout	0.05%	0.05%	0.01%	0.01%	0.01%	+	0.03%	0.06%	0.07%	-	0.01%	0.01%
Sander vitreus	Walleye	1.17%	0.96%	0.56%	0.51%	0.87%	+	1.78%	1.05%	0.95%	0.57%	0.34%	0.60%
Scardinius erythrophthalmus	Common Rudd	0.78%	1.09%	0.08%	0.08%	0.20%	-	0.07%	1.32%	2.28%	0.04%	0.13%	0.33%
Semotilus atromaculatus	Creek Chub	0.01%	0.02%	0.01%	-	0.01%	-	0.01%	0.02%	0.05%	0.02%	-	0.02%
Cyprinella spiloptera	Spotfin Shiner	0.003%	0.005%	-	0.004%	-	-	-	0.004%	0.01%	-	0.01%	-
Hypentelium nigricans	Northern Hogsucker	-	-	-	0.01%	-	-	-	-	-	-	0.01%	-
Luxilus cornutus	Common Shiner	0.02%	0.02%	-	0.002%	0.004%	+	0.03%	0.03%	0.03%	-	0.01%	0.01%
Moxostoma valenciennesi	Greater Redhorse	-	-	-	0.05%	0.06%	+	0.10%	-	-	-	0.07%	0.07%
Percina caprodes	Common Logperch	0.05%	-	-	0.002%	0.004%	-	-	0.20%	-	-	0.01%	0.01%
Pimephales promelas	Fathead Minnow	0.01%	0.01%	-	0.01%	0.05%	+	0.06%	0.02%	0.02%	-	-	0.07%
Exoglossum maxillingua	Cutlips Minnow	-	-	-	-	0.004%	-	-	-	-	-	-	-
Oncorhynchus mykiss	Rainbow Trout	0.003%	-	-	-	0.004%	-	-	0.01%	-	-	-	-
Rhinichthys atratulus	Blacknose Dace	-	-	-	-	0.004%	-	-	-	-	-	-	0.01%

TABLE 2E.4 FISH MONITORING -
RELATIVE ABUNDANCE BASELINE COMPARISON

Scientific Name	Common Name	Change Remediation Area	Remediation 2020	Unremediated Baseline (2008-2011)	Unremediated Construction (2012-2016)	Unremediated Area 2017	Unremediated Area 2018	Unremediated Area 2019	Unremediated Area Change	Unremediated Area 2020
Acipenser fulvescens	Lake Sturgeon	-	-	0.03%	0.03%	0.03%	0.01%	-	-	-
Alosa pseudoharengus	Alewife	+	4.28%	3.64%	0.03%	1.38%	6.43%	0.22%	+	8.07%
Ambloplites rupestris	Rock Bass	+	5.46%	1.28%	0.83%	1.05%	1.78%	2.72%	+	4.16%
Ameiurus natalis	Yellow Bullhead	-	0.02%	0.11%	0.04%	0.07%	0.11%	0.19%	+	0.21%
Ameiurus nebulosus	Brown Bullhead	+	3.30%	1.81%	1.67%	2.11%	0.71%	6.09%	-	0.37%
Amia calva	Bowfin	-	0.15%	0.57%	0.33%	0.16%	0.10%	0.13%	-	0.09%
Aplodinotus grunniens	Freshwater Drum	+	0.26%	0.30%	0.34%	0.27%	0.27%	0.47%	+	0.84%
Carassius auratus	Goldfish	-	-	0.47%	0.02%	-	0.01%	-	-	-
Carpoides cyprinus	Quillback	-	-	0.01%	0.01%	0.01%	0.01%	0.02%	+	0.03%
Catostomus commersonii	White Sucker	+	0.08%	0.52%	0.19%	0.07%	0.03%	0.04%	+	0.04%
Culaea inconstans	Brook Stickleback	+	0.05%	0.07%	0.11%	-	-	-	-	-
Cyprinus carpio	Common Carp	+	0.92%	1.38%	0.95%	0.50%	0.85%	2.58%	-	0.75%
Dorosoma cepedianum	Gizzard Shad	+	6.61%	0.65%	0.60%	0.35%	1.25%	0.46%	+	1.18%
Esox masquinongy x Esox lucius	Tiger Muskellunge	-	-	0.04%	0.08%	-	-	0.01%	-	-
Esox niger	Chain Pickerel	-	-	0.004%	0.06%	0.01%	-	-	-	-
Esox lucius	Northern Pike	-	0.01%	0.09%	-	0.07%	0.01%	0.01%	+	0.04%
Etheostoma olmstedi	Tesselated Darter	-	-	0.44%	0.11%	-	-	0.01%	-	-
Fundulus diaphanus	Banded Killifish	-	33.60%	37.77%	49.62%	46.77%	45.17%	32.37%	+	34.63%
Ictalurus punctatus	Channel Catfish	+	0.37%	0.52%	0.22%	0.08%	0.20%	0.10%	+	0.19%
Labidesthes sicculus	Brook Silverside	-	-	0.06%	0.06%	0.09%	0.02%	0.01%	+	0.09%
Lepisosteus osseus	Longnose Gar	-	0.02%	0.29%	0.11%	0.01%	0.02%	0.06%	-	0.03%
Lepomis cyanellus	Green Sunfish	-	1.62%	0.27%	0.45%	1.24%	0.47%	0.79%	+	0.94%
Lepomis gibbosus	Pumpkinseed	+	0.43%	9.34%	2.95%	1.56%	0.85%	0.35%	+	0.98%
Lepomis macrochirus	Bluegill	-	9.02%	13.84%	11.20%	19.35%	14.84%	23.40%	-	9.08%
Micropterus dolomieu	Smallmouth Bass	+	0.28%	0.47%	0.24%	0.14%	0.18%	0.11%	+	0.26%
Micropterus salmoides	Largemouth Bass	-	10.20%	10.91%	12.78%	9.80%	16.91%	14.53%	-	7.48%
Morone americana	White Perch	-	0.19%	1.27%	0.29%	0.20%	0.10%	0.06%	+	0.15%
Moxostoma anisurum	Silver Redhorse	-	-	0.03%	0.02%	-	-	0.01%	-	-
Moxostoma macrolepidotum	Shorthead Redhorse	+	0.03%	0.13%	0.08%	0.04%	0.02%	0.03%	+	0.07%
Neogobius melanostomus	Round Goby	+	20.94%	3.72%	6.32%	9.60%	6.00%	12.79%	+	26.55%
Notemigonus crysoleucas	Golden Shiner	-	0.09%	1.40%	0.79%	0.30%	0.16%	0.03%	+	0.09%
Notropis atherinoides	Emerald Shiner	+	0.18%	0.12%	0.19%	0.05%	0.83%	0.03%	-	0.01%
Noturus gyrinus	Tadpole Madtom	-	0.06%	0.04%	0.05%	0.18%	0.01%	0.02%	-	0.01%
Noturus insignis	Margined Madtom	-	-	-	-	-	0.02%	0.02%	-	-
Perca flavescens	Yellow Perch	-	0.11%	1.83%	1.22%	3.38%	1.56%	0.99%	-	0.25%
Pimephales notatus	Bluntnose Minnow	-	-	0.19%	0.30%	0.40%	0.20%	0.06%	+	0.90%
Pomoxis nigromaculatus	Black Crappie	-	-	0.26%	0.06%	0.03%	0.02%	-	-	-
Salmo trutta	Brown Trout	+	0.02%	0.04%	0.03%	0.02%	0.01%	0.01%	+	0.03%
Sander vitreus	Walleye	+	1.44%	1.34%	0.96%	0.54%	0.75%	1.20%	+	2.22%
Scardinius erythrophthalmus	Common Rudd	-	0.10%	0.26%	0.36%	0.15%	0.0%	0.03%	+	0.03%
Semotilus atromaculatus	Creek Chub	-	0.01%	0.003%	0.003%	-	-	-	-	-
Cyprinella spiloptera	Spotfin Shiner	-	-	0.001%	0.003%	-	0.01%	-	-	-
Hypentelium nigricans	Northern Hogsucker	-	-	-	-	-	0.01%	-	-	-
Luxilus cornutus	Common Shiner	+	0.05%	0.003%	0.003%	-	0.01%	0.01%	-	-
Moxostoma valenciennesi	Greater Redhorse	-	0.06%	-	-	-	0.07%	0.04%	+	0.16%
Percina caprodes	Common Logperch	-	-	0.02%	-	-	0.01%	-	-	-
Pimephales promelas	Fathead Minnow	-	0.05%	0.007%	0.01%	-	-	0.02%	+	0.09%
Exoglossum maxillingua	Cutlips Minnow	-	-	-	-	-	-	0.01%	-	-
Oncorhynchus mykiss	Rainbow Trout	-	-	-	-	-	-	-	-	-
Rhinichthys atratulus	Blacknose Dace	-	-	-	-	-	-	-	-	-

TABLE 2E.5 FISH OBSERVED DURING MONITORING FOR ADULT NORTHERN PIKE AND WETLAND SPAWNING SPECIES[1]

Location[1]	Date	Banded Killifish	Bluegill	Bluntnose Minnow	Brook Silverside	Brook Stickleback	Brown Bullhead	Brown Trout	Common Carp	Creek Chub	Emerald Shiner	Gizzard Shad	Golden Shiner	Green Sunfish
Location 3	3/11/2020	0	9	0	1	0	1	0	2	0	0	3	0	0
Location 2	3/11/2020	1	4	0	0	0	2	0	0	1	3	6	4	0
Location 3	3/12/2020	2	31	0	0	0	0	0	0	0	3	2	2	1
Location 2	3/12/2020	11	43	0	0	0	2	0	0	0	19	1	1	0
Location 1	3/18/2020	15	27	0	0	0	0	1	2	1	39	0	7	2
Location 2	3/18/2020	13	54	0	0	0	2	0	0	0	13	0	9	3
Location 1	3/19/2020	7	252	0	0	0	0	0	4	0	1	0	1	4
Location 2	3/19/2020	120	363	2	0	0	12	0	13	7	7	0	29	15
Location 3	3/25/2020	3	1	0	0	0	0	0	0	0	0	0	0	0
Location 2	3/25/2020	350	232	0	0	0	11	0	2	1	4	0	29	1
Location 3	3/26/2020	0	0	0	0	0	0	0	1	0	0	0	0	0
Location 2	3/26/2020	111	30	0	0	0	11	0	1	0	21	2	16	2
Location 2	4/1/2020	0	7	0	0	0	2	0	0	0	0	0	0	0
Location 3	4/1/2020	0	4	0	0	0	0	0	1	0	0	17	0	1
Location 3	4/2/2020	1	66	0	0	0	0	0	2	0	0	6	0	2
Location 2	4/2/2020	138	55	0	0	0	11	0	0	2	4	0	3	4
Location 3	4/8/2020	0	7	0	0	0	0	0	0	0	0	0	0	0
Location 2	4/8/2020	222	46	0	0	0	24	0	1	1	0	0	3	5
Location 3	4/9/2020	1	7	0	0	0	0	0	0	0	1	0	0	3
Location 2	4/9/2020	77	117	0	0	0	8	0	1	3	1	0	9	14
Location 3	4/15/2020	0	6	0	0	0	0	0	0	0	0	0	0	0
Location 2	4/15/2020	133	9	0	0	0	1	0	0	0	1	0	2	3
Location 3	4/16/2020	2	18	0	0	0	0	0	0	0	0	0	1	1
Location 2	4/16/2020	203	2	0	0	0	10	0	0	0	0	0	0	1
Location 3	4/22/2020	40	39	0	0	0	2	0	0	0	2	0	7	5
Location 2	4/22/2020	5	9	0	0	0	1	0	0	0	0	0	0	4
Location 3	4/23/2020	4	1	0	0	0	0	0	0	0	0	0	0	0
Location 2	4/23/2020	3	2	0	0	0	1	0	0	0	0	0	0	0
Location 3	4/29/2020	5	243	2	0	0	0	0	2	2	3	2	15	0
Location 2	4/29/2020	6	26	0	0	0	0	0	0	0	1	0	10	1
Location 2	4/30/2020	0	14	0	1	0	0	0	0	0	0	1	1	0
Location 3	4/30/2020	0	32	0	0	0	0	0	0	0	1	0	2	0
Location 3	5/6/2020	0	8	0	0	1	0	0	0	0	0	0	97	0
Location 2	5/6/2020	11	4	0	0	0	0	0	0	0	0	1	1	0
Location 3	5/7/2020	1	14	0	0	0	0	0	0	0	0	0	1	0
Location 2	5/7/2020	1	12	0	0	0	0	0	0	0	0	0	2	0

[1]A map depicting fish sampling locations can be found in Figure 2.5

TABLE 2E.5 FISH OBSERVED DURING MONITORING FOR ADULT NORTHERN PIKE AND WETLAND SPAWNING SPECIES[1]

Location[1]	Date	Largemouth Bass	Pumpkinseed	Rock Bass	Round Goby	White Perch	White Sucker	Yellow Perch
Location 3	3/11/2020	1	0	0	1	0	0	0
Location 2	3/11/2020	0	0	0	9	0	0	1
Location 3	3/12/2020	0	3	0	3	0	0	0
Location 2	3/12/2020	0	1	2	10	0	0	2
Location 1	3/18/2020	0	1	1	6	0	0	0
Location 2	3/18/2020	0	2	1	3	0	1	1
Location 1	3/19/2020	6	5	10	2	0	0	0
Location 2	3/19/2020	4	17	12	4	0	0	2
Location 3	3/25/2020	0	0	0	0	0	0	0
Location 2	3/25/2020	4	3	0	2	0	0	0
Location 3	3/26/2020	0	0	0	0	0	0	0
Location 2	3/26/2020	3	0	3	1	0	0	0
Location 2	4/1/2020	0	0	0	2	0	0	0
Location 3	4/1/2020	0	0	0	2	0	0	0
Location 3	4/2/2020	0	2	1	9	0	0	0
Location 2	4/2/2020	2	2	2	7	0	1	0
Location 3	4/8/2020	0	0	0	1	0	0	0
Location 2	4/8/2020	1	5	10	10	1	0	0
Location 3	4/9/2020	1	0	0	7	0	0	0
Location 2	4/9/2020	1	3	8	9	1	0	0
Location 3	4/15/2020	0	0	0	1	0	0	0
Location 2	4/15/2020	0	1	0	0	0	0	0
Location 3	4/16/2020	3	0	0	4	0	0	0
Location 2	4/16/2020	2	0	0	0	1	0	0
Location 3	4/22/2020	1	3	7	0	0	0	0
Location 2	4/22/2020	0	3	0	0	0	0	0
Location 3	4/23/2020	0	0	0	0	0	0	0
Location 2	4/23/2020	0	0	0	0	0	0	0
Location 3	4/29/2020	1	3	0	0	1	0	0
Location 2	4/29/2020	0	1	0	7	1	0	1
Location 2	4/30/2020	1	0	0	0	0	0	0
Location 3	4/30/2020	0	1	0	0	0	0	0
Location 3	5/6/2020	0	1	0	1	0	0	0
Location 2	5/6/2020	0	0	0	6	0	0	0
Location 3	5/7/2020	0	0	0	5	0	0	0
Location 2	5/7/2020	0	1	2	8	1	0	0

[1]A map depicting fish sampling locations can be found in Figure 2.5

TABLE 2E.6 FISH OBSERVED DURING MONITORING FOR JUVENILE NORTHERN PIKE AND WETLAND SPAWNING SPECIES[1]

Collection Method	Green Sunfish	White Perch	Banded Killifish	Largemouth Bass	Round Goby	Common Carp	Brown Bullhead	Pumpkinseed	Cyprind Species	Common Shiner	Bluegil
Minnow Trap	49	1	5	2	24	2	5	5	1	1	4
Visual Observations	0		1	0	0	1	0	0	0	0	0

TABLE 2E.7 2020 WILDLIFE OBSERVATIONS

Scientific Name	Common Name	Type of Observation	Habitat Use	Remediation Area A	Remediation Area B	Remediation Area C	Remediation Area D	Remediation Area E
Birds								
Accipiter striatus	Sharp-shinned Hawk	Visual	General				X	
Actitis macularius	Spotted Sandpiper	Visual	General, Feeding				X	
Agelaius phoeniceus	Red-winged Blackbird	Visual	General				X	
Aix sponsa	Wood Duck	Visual	General	X				
Anas platyrhynchos	Mallard	Visual	Feeding, Nesting	X	X	X	X	X
Ardea alba	Great Egret	Visual	General, Feeding	X			X	
Ardea herodias	Great Blue Heron	Visual	General, Feeding	X	X	X	X	X
Aythya americana	Redhead	Visual	General	X	X	X		
Aythya collaris	Ring-necked Duck	Visual	General				X	
Bombycilla cedrorum	Cedar Waxwing	Visual	General, Feeding	X				
Branta canadensis	Canada Goose	Visual	Feeding, Nesting	X	X	X	X	X
Buteo jamaicensis	Red-tailed Hawk	Visual	General, Feeding	X			X	
Butorides virescens	Green Heron	Visual	General, Feeding	X				
Calidris minutilla	Least Sandpiper	Visual	General, Feeding					
Cathartes aura	Turkey Vulture	Visual	General	X				
Chaetura pelagica	Chimney Swift	Visual	General				X	
Charadrius vociferus	Killdeer	Visual	General, Nesting		X	X	X	
Chordeiles minor	Common Nighthawk	Visual	General				X	
Chroicocephalus philadelphia	Bonaparte's Gull	Visual	General	X				
Corvus brachyrhynchos	American Crow	Visual	General					X
Cygnus buccinator	Trumpeter Swan	Visual	General, Feeding	X				
Cygnus columbianus	Tundra Swan	Visual	General, Feeding	X				
Cygnus olor	Mute Swan	Visual	General, Feeding	X		X	X	X
Dumetella carolinensis	Gray Catbird	Visual	General	X				
Empidonax alnorum	Alder Flycatcher	Visual	General	X			X	
Falco peregrinus	Peregrine Falcon	Visual	General, Feeding					X
Fulica americana	American Coot	Visual	General, Feeding	X				
Gallinula galeata	Common Gallinule	Visual	General	X				
Haliaeetus leucocephalus	Bald Eagle	Visual	General, Feeding	X	X			X
Hirundo rustica	Barn Swallow	Visual	General	X			X	
Hydroprogne caspia	Caspian Tern	Visual	General, Nesting	X	X		X	X

TABLE 2E.7 2020 WILDLIFE OBSERVATIONS (CONTINUED)

Scientific Name	Common Name	Type of Observation	Habitat Use	Remediation Area A	Remediation Area B	Remediation Area C	Remediation Area D	Remediation Area E
Larus delawarensis	Ring-billed Gull	Visual	General		X		X	
Larus maritimus	Great Black Backed Gull	Visual	General		X		X	X
Larus smithsonianus	Herring Gull	Visual	General		X		X	
Mareca penelope	Eurasian Widgeon	Visual	General	X				
Melospiza melodia	Song Sparrow	Visual	General				X	
Mergus merganser	Belted Kingfisher	Visual	General	X		X		X
Mergus merganser	Common Merganser	Visual	General	X		X	X	X
Pandion haliaetus	Osprey	Visual	General	X		X	X	
Phalacrocorax auritus	Double-crested Cormorant	Visual	General	X		X	X	X
Pluvialis squatarola	Black-bellied Plover	Visual	General				X	
Podilymbus podiceps	Pied-billed Grebe	Visual	General			X		
Setophaga palmarum	Palm Warbler	Visual	General				X	
Spatula discors	Blue-winged Teal	Visual	General				X	
Spinus tristis	American Goldfinch	Visual	General	X	X	X	X	
Sterna hirundo	Common Tern	Visual	General				X	X
Tachycineta bicolor	Tree Swallow	Visual	General	X			X	
Tringa sp.	Yellowlegs	Visual	General, Feeding		X			
Zenaida macroura	Mourning Dove	Visual	General		X	X	X	

TABLE 2E.7 2020 WILDLIFE OBSERVATIONS (CONTINUED)

Scientific Name	Common Name	Type of Observation	Habitat Use	Remediation Area A	Remediation Area B	Remediation Area C	Remediation Area D	Remediation Area E
Fish[1]								
Acipenser fulvescens	Lake Sturgeon	Visual	General				X	
Alosa pseudoharengus	Alewife	Visual	General		X	X	X	X
Ambloplites rupestris	Rock Bass	Visual	General	X	X	X	X	X
Ameiurus natalis	Yellow Bullhead	Visual	General	X				
Ameiurus nebulosus	Brown Bullhead	Visual	General	X	X	X	X	X
Amia calva	Bowfin	Visual	General	X			X	X
Aplodinotus grunniens	Freshwater Drum	Visual	General	X	X	X	X	X
Carpiodes cyprinus	Quillback	Visual	General					
Catostomus commersonii	White Sucker	Visual	General	X	X	X	X	X
Culaea inconstans	Brook Stickleback	Visual	General	X			X	X
Cyprinus carpio	Common Carp	Visual	General, Spawning	X	X	X	X	X
Dorosoma cepedianum	Gizzard Shad	Visual	General	X	X	X	X	X
Esox lucius	Northern Pike	Visual	General		X			
Fundulus diaphanus	Banded Killifish	Visual	General	X	X	X	X	X
Ictalurus punctatus	Channel Catfish	Visual	General	X	X	X	X	X
Labidesthes sicculus	Brook Silverside	Visual	General				X	
Lepisosteus osseus	Longnose Gar	Visual	General		X	X		
Lepomis cyanellus	Green Sunfish	Visual	General	X		X	X	X
Lepomis gibbosus	Pumpkinseed	Visual	General, Nesting	X	X	X	X	X
Lepomis macrochirus	Bluegill	Visual	General, Nesting	X	X	X	X	X
Luxilus cornutus	Common Shiner	Visual	General					X
Micropterus dolomieu	Smallmouth Bass	Visual	General, Nesting	X	X		X	X
Micropterus salmoides	Largemouth Bass	Visual	General, Nesting	X	X	X	X	X
Morone americana	White Perch	Visual	General	X	X	X	X	X
Moxostoma macrolepidotum	Shorthead Redhorse	Visual	General			X	X	X
Neogobius melanostomus	Round Goby	Visual	General	X	X	X	X	X
Notemigonus crysoleucas	Greater Redhorse	Visual	General	X	X		X	X
Notropis atherinoides	Emerald Shiner	Visual	General	X			X	X
Noturus gyrinus	Tadpole Madtom	Visual	General	X	X			
Perca flavescens	Yellow Perch	Visual	General	X	X		X	X
Pimephales notatus	Bluntnose Minnow	Visual	General				X	
Pimephales promelas	Fathead Minnow	Visual	General					X
Salmo trutta	Brown Trout	Visual	General			X		X
Sander vitreus	Walleye	Visual	General	X	X	X	X	X
Scardinius erythrophthalmus	Common Rudd	Visual	General	X			X	X
Semotilus atromaculatus	Creek Chub	Visual	General				X	X

TABLE 2E.7 2020 WILDLIFE OBSERVATIONS (CONTINUED)

Scientific Name	Common Name	Type of Observation	Habitat Use	Remediation Area A	Remediation Area B	Remediation Area C	Remediation Area D	Remediation Area E
Macroinvertebrates								
Anisoptera	Damselfly	Visual	General	X			X	X
Apis mellifera	Honeybee	Visual	General, Feeding				X	
Bombus sp.	Bumblebee	Visual	General, Feeding				X	
Coccinellidae	Ladybug	Visual	General	X			X	
Cupido comyntas	Eastern Tailed-blue butterfly	Visual	General				X	
Curculionoidea	Weevil	Visual	General				X	
Danaus plexippus	Monarch Butterfly	Visual	General			X	X	
Gryllidae	Cricket	Visual	General					
Hymenoptera	Wasp	Visual	General				X	
Ichneumonidae	Ichneumon Wasp	Visual	General				X	
Lepidoptera	Butterfly	Visual	General					X
Limenitis archippus	Viceroy Butterfly	Visual	General				X	
Melanoplus femurrubrum	Red-legged Grasshopper	Visual	General				X	
Microcentrum rhombifolium	Broad-winged Katydid	Visual	General				X	
Muscidae	House Fly	Visual	General				X	
Notonectidae	Backswimmer	Visual	General	X				
Odonata	Dragonfly	Visual	General	X			X	X
Orthoptera	Grasshopper	Visual	General			X	X	
Papilionidae	Swallowtail Butterfly	Visual	General				X	
Phoebis sennae	Cloudless Sulphur Butterfly	Visual	General				X	
Phyciodes tharos	Pearl crescent Butterfly	Visual	General				X	
Pieris rapae	Cabbage White Butterfly	Visual	General			X	X	
Succinea putris	Amber Snail	Visual	General				X	
Mammals								
Marmota monax	Woodchuck	Visual	General				X	
Odocoileus virginianus	White-tailed Deer	Visual	Feeding	X				
Ondatra zibethicus	Muskrat	Lodge	General	X				
Sylvilagus floridanus	Eastern Cottontail	Visual	General	X	X			
Reptile/Amphibian								
Chrysemys picta	Painted Turtle	Visual	Basking				X	
Lithobates pipiens	Northern Leopard Frog	Visual	General			X		
Nerodia sipedon	Common Water Snake	Visual	Basking	X			X	

[1] Due to the fact that aquatic wildlife is difficult to visually observe, the majority of fish species were observed using trap, gill and seine nets associated with community fish monitoring performed by the SUNY ESF sampling team.

APPENDIX 2F – COMPREHENSIVE SOIL ASSESSMENT

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1523
Field ID:	HB1
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **silt loam**

Sand: **28%** - Silt: **53%** - Clay: **18%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.28**	**96**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**61.9**	**95**	
biological	Organic Matter	**3.2**	**57**	
biological	ACE Soil Protein Index	**11.0**	**91**	
biological	Soil Respiration	**1.1**	**96**	
biological	Active Carbon	**702**	**86**	
chemical	Soil pH	**7.0**	**100**	
chemical	Extractable Phosphorus	**7.3**	**100**	
chemical	Extractable Potassium	**123.5**	**100**	
chemical	Minor Elements Mg: 145.3 / Fe: 89.7 / Mn: 94.8 / Zn: 0.8		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **83** / Very High

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID:	TT1524
Field ID:	HB2
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **silt loam**

Sand: **32%** - Silt: **53%** - Clay: **13%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.28**	**96**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**61.3**	**95**	
biological	Organic Matter	**3.2**	**59**	
biological	ACE Soil Protein Index	**11.0**	**91**	
biological	Soil Respiration	**1.1**	**94**	
biological	Active Carbon	**672**	**82**	
chemical	Soil pH	**6.9**	**100**	
chemical	Extractable Phosphorus	**6.3**	**100**	
chemical	Extractable Potassium	**91.6**	**100**	
chemical	Minor Elements Mg: 150.9 / Fe: 60.2 / Mn: 96.2 / Zn: 0.8		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **83** / Very High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1525
Field ID:	HB3
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **silt loam**

Sand: **28%** - Silt: **54%** - Clay: **17%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.29**	**97**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**58.3**	**93**	
biological	Organic Matter	**3.5**	**72**	
biological	ACE Soil Protein Index	**11.4**	**93**	
biological	Soil Respiration	**1.6**	**99**	
biological	Active Carbon	**773**	**93**	
chemical	Soil pH	**7.5**	**91**	
chemical	Extractable Phosphorus	**6.6**	**100**	
chemical	Extractable Potassium	**158.7**	**100**	
chemical	Minor Elements Mg: 191.4 / Fe: 48.9 / Mn: 46.5 / Zn: 2.4		**56**	

Overall Quality Score: **89** / Very High

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID:	TT1526
Field ID:	HB4
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **silt loam**

Sand: **26%** - Silt: **58%** - Clay: **15%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.31**	**99**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**15.0**	**18**	Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff
biological	Organic Matter	**3.6**	**75**	
biological	ACE Soil Protein Index	**8.7**	**74**	
biological	Soil Respiration	**1.2**	**98**	
biological	Active Carbon	**855**	**97**	
chemical	Soil pH	**7.6**	**84**	
chemical	Extractable Phosphorus	**3.9**	**100**	
chemical	Extractable Potassium	**35.1**	**49**	
chemical	Minor Elements Mg: 223.4 / Fe: 68.0 / Mn: 169.5 / Zn: 0.8		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **71** / High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1527
Field ID:	HB5
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **silt loam**

Sand: **18%** - Silt: **60%** - Clay: **21%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.33**	**99**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**11.1**	**13**	Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff
biological	Organic Matter	**4.3**	**92**	
biological	ACE Soil Protein Index	**11.6**	**93**	
biological	Soil Respiration	**1.5**	**99**	
biological	Active Carbon	**1060**	**99**	
chemical	Soil pH	**7.4**	**95**	
chemical	Extractable Phosphorus	**10.7**	**100**	
chemical	Extractable Potassium	**189.6**	**100**	
chemical	Minor Elements Mg: 274.9 / Fe: 146.2 / Mn: 190.3 / Zn: 2.0		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **80** / Very High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1528
Field ID:	HB6
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **silt loam**

Sand: **31%** - Silt: **55%** - Clay: **13%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.30**	**98**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**25.2**	**37**	
biological	Organic Matter	**3.5**	**71**	
biological	ACE Soil Protein Index	**8.9**	**76**	
biological	Soil Respiration	**1.4**	**99**	
biological	Active Carbon	**791**	**94**	
chemical	Soil pH	**7.5**	**92**	
chemical	Extractable Phosphorus	**4.4**	**100**	
chemical	Extractable Potassium	**36.3**	**52**	
chemical	Minor Elements Mg: 225.1 / Fe: 47.6 / Mn: 116.5 / Zn: 1.2		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **73** / High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1529
Field ID:	HB7
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **loam**

Sand: **50%** - Silt: **28%** - Clay: **20%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.23**	**85**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**22.9**	**32**	
biological	Organic Matter	**3.2**	**58**	
biological	ACE Soil Protein Index	**7.9**	**66**	
biological	Soil Respiration	**1.2**	**98**	
biological	Active Carbon	**895**	**98**	
chemical	Soil pH	**7.7**	**73**	
chemical	Extractable Phosphorus	**4.1**	**100**	
chemical	Extractable Potassium	**82.6**	**100**	
chemical	Minor Elements Mg: 309.8 / Fe: 101.6 / Mn: 188.1 / Zn: 1.8		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **72** / High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1530
Field ID:	HB8
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **sandy loam**

Sand: **53%** - Silt: **27%** - Clay: **18%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.24**	**94**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**21.5**	**29**	
biological	Organic Matter	**3.6**	**97**	
biological	ACE Soil Protein Index	**8.8**	**65**	
biological	Soil Respiration	**1.3**	**99**	
biological	Active Carbon	**999**	**99**	
chemical	Soil pH	**7.6**	**77**	
chemical	Extractable Phosphorus	**5.2**	**100**	
chemical	Extractable Potassium	**122.3**	**100**	
chemical	Minor Elements Mg: 290.9 / Fe: 135.1 / Mn: 226.2 / Zn: 1.9		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **77** / High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1531
Field ID:	HB9
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **sandy clay loam**

Sand: **52%** - Silt: **27%** - Clay: **20%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.26**	**94**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**35.8**	**60**	
biological	Organic Matter	**4.1**	**87**	
biological	ACE Soil Protein Index	**12.4**	**96**	
biological	Soil Respiration	**1.7**	**99**	
biological	Active Carbon	**1044**	**99**	
chemical	Soil pH	**7.3**	**100**	
chemical	Extractable Phosphorus	**8.2**	**100**	
chemical	Extractable Potassium	**129.2**	**100**	
chemical	Minor Elements Mg: 268.1 / Fe: 178.3 / Mn: 190.9 / Zn: 2.9		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **85** / Very High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1532
Field ID:	HB10
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **sandy clay loam**

Sand: **51%** - Silt: **25%** - Clay: **22%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.25**	**92**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**38.4**	**65**	
biological	Organic Matter	**3.7**	**77**	
biological	ACE Soil Protein Index	**11.8**	**94**	
biological	Soil Respiration	**1.6**	**99**	
biological	Active Carbon	**1028**	**99**	
chemical	Soil pH	**7.6**	**79**	
chemical	Extractable Phosphorus	**7.9**	**100**	
chemical	Extractable Potassium	**170.2**	**100**	
chemical	Minor Elements Mg: 248.8 / Fe: 266.7 / Mn: 223.6 / Zn: 3.1		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **82** / Very High

Comprehensive Assessment of Soil Health

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Sample ID: TT1533
Field ID: HB11
Date Sampled: 02/24/2020
Tillage: no till

Measured Soil Textural Class: **loam**

Sand: **46%** - Silt: **31%** - Clay: **21%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.27**	**95**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**18.9**	**24**	
biological	Organic Matter	**3.8**	**80**	
biological	ACE Soil Protein Index	**9.2**	**79**	
biological	Soil Respiration	**1.4**	**99**	
biological	Active Carbon	**1021**	**99**	
chemical	Soil pH	**7.7**	**74**	
chemical	Extractable Phosphorus	**5.2**	**100**	
chemical	Extractable Potassium	**116.4**	**100**	
chemical	Minor Elements Mg: 293.6 / Fe: 285.7 / Mn: 278.9 / Zn: 2.7		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **76** / High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1534
Field ID:	HB12
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **sandy loam**

Sand: **52%** - Silt: **30%** - Clay: **16%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.25**	**96**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**41.6**	**72**	
biological	Organic Matter	**3.7**	**98**	
biological	ACE Soil Protein Index	**10.4**	**80**	
biological	Soil Respiration	**1.5**	**99**	
biological	Active Carbon	**965**	**99**	
chemical	Soil pH	**7.7**	**72**	
chemical	Extractable Phosphorus	**6.4**	**100**	
chemical	Extractable Potassium	**144.7**	**100**	
chemical	Minor Elements Mg: 233.2 / Fe: 162.2 / Mn: 186.9 / Zn: 3.3		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **83** / Very High

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID:	TT1535
Field ID:	HB13
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **loam**

Sand: **50%** - Silt: **28%** - Clay: **20%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.20**	**70**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**12.8**	**15**	Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff
biological	Organic Matter	**2.5**	**28**	
biological	ACE Soil Protein Index	**6.2**	**46**	
biological	Soil Respiration	**0.8**	**77**	
biological	Active Carbon	**827**	**96**	
chemical	Soil pH	**7.7**	**62**	
chemical	Extractable Phosphorus	**4.7**	**100**	
chemical	Extractable Potassium	**65.4**	**90**	
chemical	Minor Elements Mg: 232.1 / Fe: 170.9 / Mn: 187.5 / Zn: 2.3		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **60** / High

Comprehensive Assessment of Soil Health

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Sample ID:	TT1536
Field ID:	SS1
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **silt loam**

Sand: **28%** - Silt: **53%** - Clay: **18%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.27**	**95**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**25.0**	**37**	
biological	Organic Matter	**3.9**	**83**	
biological	ACE Soil Protein Index	**7.0**	**56**	
biological	Soil Respiration	**1.3**	**98**	
biological	Active Carbon	**798**	**94**	
chemical	Soil pH	**7.6**	**81**	
chemical	Extractable Phosphorus	**5.4**	**100**	
chemical	Extractable Potassium	**34.7**	**49**	
chemical	Minor Elements Mg: 277.3 / Fe: 9.8 / Mn: 68.0 / Zn: 1.3		**56**	

Overall Quality Score: **75** / High

Comprehensive Assessment of Soil Health

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Sample ID:	TT1537
Field ID:	SS2
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **loam**

Sand: **31%** - Silt: **45%** - Clay: **23%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.26**	**93**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**30.2**	**48**	
biological	Organic Matter	**3.6**	**75**	
biological	ACE Soil Protein Index	**7.5**	**62**	
biological	Soil Respiration	**1.1**	**96**	
biological	Active Carbon	**774**	**93**	
chemical	Soil pH	**7.4**	**96**	
chemical	Extractable Phosphorus	**3.3**	**93**	
chemical	Extractable Potassium	**29.4**	**38**	
chemical	Minor Elements Mg: 175.3 / Fe: 31.5 / Mn: 50.3 / Zn: 0.4		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **71** / High

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID:	TT1538
Field ID:	SS3
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **clay loam**

Sand: **20%** - Silt: **47%** - Clay: **32%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.29**	**97**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**21.7**	**24**	
biological	Organic Matter	**4.6**	**73**	
biological	ACE Soil Protein Index	**9.3**	**86**	
biological	Soil Respiration	**1.7**	**99**	
biological	Active Carbon	**926**	**96**	
chemical	Soil pH	**7.4**	**97**	
chemical	Extractable Phosphorus	**4.8**	**100**	
chemical	Extractable Potassium	**39.2**	**57**	
chemical	Minor Elements Mg: 292.2 / Fe: 255.5 / Mn: 167.6 / Zn: 0.9		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **74** / High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1539
Field ID:	SS4
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **clay loam**

Sand: **23%** - Silt: **45%** - Clay: **31%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.28**	**96**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**15.1**	**14**	Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff
biological	Organic Matter	**3.8**	**43**	
biological	ACE Soil Protein Index	**8.0**	**75**	
biological	Soil Respiration	**1.4**	**99**	
biological	Active Carbon	**776**	**84**	
chemical	Soil pH	**7.5**	**92**	
chemical	Extractable Phosphorus	**5.2**	**100**	
chemical	Extractable Potassium	**49.9**	**74**	
chemical	Minor Elements Mg: 306.3 / Fe: 421.7 / Mn: 231.8 / Zn: 0.8		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **69** / High

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID: TT1540
Field ID: SS5
Date Sampled: 02/24/2020
Tillage: no till

Measured Soil Textural Class: **loam**

Sand: **43%** - Silt: **34%** - Clay: **22%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.21**	**79**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**12.7**	**15**	Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff
biological	Organic Matter	**2.9**	**44**	
biological	ACE Soil Protein Index	**4.8**	**29**	
biological	Soil Respiration	**0.9**	**85**	
biological	Active Carbon	**665**	**81**	
chemical	Soil pH	**7.6**	**84**	
chemical	Extractable Phosphorus	**4.5**	**100**	
chemical	Extractable Potassium	**22.7**	**26**	
chemical	Minor Elements Mg: 228.4 / Fe: 331.2 / Mn: 142.3 / Zn: 0.8		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **55** / Medium

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID:	TT1541
Field ID:	SS6
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **clay loam**

Sand: **26%** - Silt: **43%** - Clay: **29%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.28**	**97**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**25.7**	**31**	
biological	Organic Matter	**4.0**	**48**	
biological	ACE Soil Protein Index	**10.7**	**94**	
biological	Soil Respiration	**1.4**	**99**	
biological	Active Carbon	**810**	**88**	
chemical	Soil pH	**7.3**	**98**	
chemical	Extractable Phosphorus	**5.2**	**100**	
chemical	Extractable Potassium	**70.1**	**95**	
chemical	Minor Elements Mg: 230.4 / Fe: 207.4 / Mn: 61.6 / Zn: 0.5		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **76** / High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1542
Field ID:	NS1
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **loam**

Sand: **32%** - Silt: **42%** - Clay: **24%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.26**	**93**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**20.7**	**28**	
biological	Organic Matter	**3.7**	**77**	
biological	ACE Soil Protein Index	**6.8**	**54**	
biological	Soil Respiration	**1.5**	**99**	
biological	Active Carbon	**839**	**96**	
chemical	Soil pH	**7.5**	**87**	
chemical	Extractable Phosphorus	**2.9**	**83**	
chemical	Extractable Potassium	**48.3**	**73**	
chemical	Minor Elements Mg: 273.7 / Fe: 37.5 / Mn: 55.2 / Zn: 0.6		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **70** / High

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID: TT1543
Field ID: NS2
Date Sampled: 02/24/2020
Tillage: no till

Measured Soil Textural Class: **loam**

Sand: **31%** - Silt: **43%** - Clay: **25%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.24**	**89**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**18.9**	**25**	
biological	Organic Matter	**3.4**	**68**	
biological	ACE Soil Protein Index	**6.2**	**46**	
biological	Soil Respiration	**1.1**	**96**	
biological	Active Carbon	**796**	**94**	
chemical	Soil pH	**7.7**	**64**	
chemical	Extractable Phosphorus	**2.1**	**62**	
chemical	Extractable Potassium	**51.8**	**76**	
chemical	Minor Elements Mg: 312.0 / Fe: 15.6 / Mn: 38.2 / Zn: 0.5		**100**	

Overall Quality Score: **72** / High

Comprehensive Assessment of Soil Health

From the Cornell Soil Health Laboratory, Department of Soil and Crop Sciences, School of Integrative Plant Science, Cornell University, Ithaca, NY 14853. http://soilhealth.cals.cornell.edu

Jesse Carr
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Sample ID:	TT1544
Field ID:	NS3
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **loam**

Sand: **38%** - Silt: **40%** - Clay: **21%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.25**	**91**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**17.8**	**23**	
biological	Organic Matter	**3.4**	**66**	
biological	ACE Soil Protein Index	**8.3**	**70**	
biological	Soil Respiration	**1.0**	**87**	
biological	Active Carbon	**699**	**85**	
chemical	Soil pH	**7.0**	**100**	
chemical	Extractable Phosphorus	**3.5**	**99**	
chemical	Extractable Potassium	**32.9**	**45**	
chemical	Minor Elements Mg: 114.6 / Fe: 147.3 / Mn: 111.9 / Zn: 0.3		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **68** / High

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID:	TT1545
Field ID:	NS4
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **loam**

Sand: **45%** - Silt: **35%** - Clay: **19%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.23**	**84**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**14.4**	**17**	Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff
biological	Organic Matter	**2.8**	**43**	
biological	ACE Soil Protein Index	**7.1**	**56**	
biological	Soil Respiration	**1.0**	**87**	
biological	Active Carbon	**639**	**77**	
chemical	Soil pH	**7.5**	**92**	
chemical	Extractable Phosphorus	**3.7**	**100**	
chemical	Extractable Potassium	**33.4**	**46**	
chemical	Minor Elements Mg: 150.4 / Fe: 149.6 / Mn: 150.9 / Zn: 0.4		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **61** / High

Comprehensive Assessment of Soil Health

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Jesse Carr
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Sample ID:	TT1546
Field ID:	NS5
Date Sampled:	02/24/2020
Tillage:	no till

Measured Soil Textural Class: **loam**

Sand: **44%** - Silt: **36%** - Clay: **19%**

Group	Indicator	Value	Rating	Constraints
physical	Predicted Available Water Capacity	**0.23**	**85**	
physical	Surface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Subsurface Hardness			Not rated: No Field Penetrometer Readings Submitted
physical	Aggregate Stability	**30.6**	**49**	
biological	Organic Matter	**3.3**	**64**	
biological	ACE Soil Protein Index	**6.9**	**55**	
biological	Soil Respiration	**1.5**	**99**	
biological	Active Carbon	**792**	**94**	
chemical	Soil pH	**7.3**	**98**	
chemical	Extractable Phosphorus	**4.5**	**100**	
chemical	Extractable Potassium	**53.8**	**78**	
chemical	Minor Elements Mg: 235.4 / Fe: 51.3 / Mn: 104.3 / Zn: 4.2		**11**	Deficient (element(s)) / Excessive (element(s))

Overall Quality Score: **73** / High

APPENDIX 3A - DATA USABILITY AND SUMMARY REPORT ONONDAGA LAKE 2020 TISSUE MONITORING

APPENDIX 3A:

DATA USABILITY SUMMARY REPORT

2020 ONONDAGA LAKE TISSUE MONITORING ONONDAGA COUNTY, NEW YORK

Prepared For:

Honeywell

301 Plainfield Road, Suite 330
Syracuse, New York 13212

Prepared By:

PARSONS

301 Plainfield Road, Suite 350
Syracuse, New York 13212

JUNE 2021 (REVISED DECEMBER 2024)

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SECTION 3A1 DATA USABILITY SUMMARY

Fish and zooplankton samples were collected as part of the 2020 tissue monitoring efforts at Onondaga Lake from May 12, 2020 through November 18, 2020. Analytical results from these samples were validated and reviewed by Parsons for usability with respect to the following requirements:

- Work Plan
- QAPP
- USEPA Region II Standard Operating Procedures (SOPs) for organic and inorganic data review

The fish samples were collected by Parsons and the zooplankton samples were collected by Upstate Freshwater Institute (UFI).

The analytical laboratories for this project were Eurofins – Lancaster and Eurofins – Frontier (Eurofins). These laboratories are certified by the State of New York to conduct laboratory analyses for this project through the National Environmental Laboratory Accreditation Conference (NELAC) and New York Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP).

3A1.1 Laboratory Data Packages

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 7 to 54 days for the samples.

The data packages received from the laboratories were paginated, complete, and overall were of good quality. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report which is summarized in Section 2.

3A1.2 Sampling and Chain-of-Custody

The zooplankton samples were collected, shipped under a COC record, and received at the laboratory within one to two days of sampling. All samples were received intact and in good condition at Eurofins.

3A1.3 Laboratory Analytical Methods

The fish samples were collected from the site and analyzed for hexachlorobenzene, 4,4'-DDT and metabolites, polychlorinated biphenyls (PCBs), dioxins and furans, mercury, percent lipids, and/or percent moisture. The zooplankton samples were collected from the site and analyzed for low level mercury and methyl mercury. Summaries of deviations from the Work Plan, QAPP, or USEPA Region II SOPs concerning these laboratory analyses are presented in Subsections 3A1.3.1 through 3A1.3.5. The data qualifications resulting from the data validation review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are discussed for each analytical method by matrix in Section 2. The laboratory data were reviewed and may be qualified with the following validation flags:

"U" - not detected at the value given
"UJ" - estimated and not detected at the value given
"J" - estimated at the value given
"J+" - estimated biased high at the value given

"J-" - estimated biased low at the value given
"N" - presumptive evidence at the value given
"R" - unusable value

The validated laboratory data were tabulated and are presented in Attachment A.

As described in Section 3 of the main text of this report, due to homogenization issues, 56 of 148 fish samples were not properly homogenized by the lab. Based on a technical review of the homogenization issues and QA results by the project teams (i.e., NYSDEC and Honeywell), it was decided that the data associated with the 56 improperly homogenized fish would not be used, and the analytical results from the 92 properly homogenized fish will not be used for decision making or statistical analysis in this report or future reports. Improperly homogenized fish are reported in the tabulated table presented in Attachment A with the following validation flag:

"NRQ" – not reportable, poor quality

All samples (including the "NRQ" samples) were validated and included in the narrative discussions below. Data validation was completed prior to the identification of improper homogenization. Subsequently, it was decided that the analytical results of improperly homogenized samples would not be used for reporting and those results would be shown with the designation of "NRQ" instead of the analytical results provided by the lab. All below discussions regarding PARCCS requirements (such as completeness) are in relation to all samples, including the "NRQ" samples.

3A1.3.1 Low Level Mercury and Methyl Mercury Analysis

Fish samples collected from the site were analyzed for mercury using the USEPA SW846 7471B analytical method. Zooplankton samples collected from the site were analyzed for low level mercury using the USEPA 1631E analytical method; and methyl mercury using the USEPA 1630 analytical method. Certain reported results for these samples were considered estimated based upon matrix spike/matrix spike duplicate (MS/MSD) recoveries, laboratory control sample (LCS) recoveries, and laboratory duplicate precision. For the fish samples, the reported mercury analytical results were considered 100% complete and valid as reported by Eurofins prior to the identification of improper homogenization. PARCCS requirements were met. For the zooplankton samples, the reported low level mercury and methyl mercury analytical results were considered 100% complete with all data considered usable and valid as reported by Eurofins. PARCCS requirements were met.

3A1.3.2 PCB Analysis

Fish samples collected from the site were analyzed for PCBs using the USEPA SW846 8082A analytical method. Certain reported results for the PCB samples were considered estimated based upon sample surrogate recoveries, MS/MSD recoveries, LCS and LCS standard reference material (SRM) recoveries, sample result identifications, and field duplicate precision. The reported PCB analytical results were considered 100% complete and valid as reported by Eurofins prior to the identification of improper homogenization. PARCCS requirements were met.

3A1.3.3 Hexachlorobenzene, 4,4'-DDT, and Metabolites Analysis

Fish samples collected from the site were analyzed for hexachlorobenzene, 4,4'-DDT, and metabolites using the USEPA SW846 8081B analytical method. Certain reported results for these samples were qualified as estimated based upon sample surrogate recoveries, matrix spike/matrix spike duplicate (MS/MSD) recoveries, LCS and LCS SRM recoveries, instrument calibrations, and sample result identifications; and qualified as not detected

based upon blank contamination. The reported analytical results for these samples were considered 100% complete and valid as reported by Eurofins prior to the identification of improper homogenization. PARCCS requirements were met.

3A1.3.4 Dioxins and Furans

Fish samples collected from the site were analyzed for dioxins and furans using the USEPA SW846 8290A analytical method. Certain reported results for these samples were qualified as estimated based upon sample surrogate recoveries, and LCS SRM recoveries; and qualified "B" based upon blank contamination. The reported analytical results for these samples were considered 100% complete and valid as reported by Eurofins prior to the identification of improper homogenization. PARCCS requirements were met.

3A1.3.5 Percent Lipids and Percent Moisture

Fish samples collected from the site were analyzed for percent lipids and percent moisture using the USEPA SW-846 3545 and the SM 2540G analytical methods, respectively. The reported results for percent lipids and percent moisture did not require qualification resulting from data validation. The reported analytical results for these samples were considered 100% complete and valid as reported by Eurofins prior to the identification of improper homogenization. PARCCS requirements were met.

SECTION 3A2 DATA VALIDATION REPORT

3A2.1 Fish Samples

Data review has been completed for data packages generated by Eurofins containing fish samples collected from the site. The specific samples contained in these data packages, the analyses performed, and validated laboratory data are tabulated and presented in Attachment A-1. This attachment presents the fish samples in the following sample delivery group (SDG) order to include preyfish first followed by sport fish: 410-3728-1, 410-10894-1, 410-10903-1, 410-3728-4, 410-3728-5, 410-3728-6, 410-3728-7, 410-3728-2, and 410-3728-3. All of these samples were shipped under a COC record and received intact by the analytical laboratory.

Data validation was performed for all samples in accordance with the project work plan and QAPP as well as the USEPA Region II SOPs HW-36, Revision 4 "Pesticide Data Validation"; HW-37, Revision 3 "Polychlorinated Biphenyl (PCB) Aroclor Data Validation"; and HW-2c, Revision 15 "Mercury and Cyanide Data Validation." This data validation and usability report is presented by analysis type.

3A2.1.1 Mercury

The following items were reviewed for compliancy in the mercury analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration verifications
- Initial and continuing calibration, and laboratory preparation blank contamination
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries
- Laboratory duplicate precision (field duplicate precision equivalent)
- Laboratory control sample (LCS) and LCS standard reference material (SRM) recoveries
- Interference check sample recoveries
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination, MS/MSD recoveries, and laboratory duplicate precision as discussed below.

Blank Contamination

The laboratory homogenization equipment blanks associated with samples in SDGs 410-10903-1 and 410-3728-6 contained mercury below the reporting limit at concentrations of 0.00013 and 0.00011 mg/L, respectively. Validation qualification of these samples was not required.

MS/MSD Recoveries

All MS/MSD recoveries were considered acceptable and within the 80-120%R QC limit for designated spiked project samples with the exception of the MS/MSD mercury recoveries associated with samples OL-3227-01 (10%R/124%R), OL-3237-05 (46%R – MSD), OL-3222-11F (-63%R/-67%R), OL-3220-04F (7%R/67%R), OL-3229-05F (78%R/30%R), OL-3223-04F (42%R – MSD), and OL-3230-04F (178%R). Therefore, mercury results were considered estimated and qualified "J" for the affected samples with the exception of OL-3230-04F since mercury was not detected.

Laboratory Duplicate Precision

All laboratory duplicate precision results were considered acceptable with precision within the 0-20%RPD with the exception of the laboratory duplicate precision for mercury associated with samples OL-3227-01 (25%RPD) and OL-3229-05F (22%RPD). Therefore, the mercury results were considered estimated and qualified "J" for the affected samples.

Usability

Prior to the identification of improper homogenization, all mercury sample results for the fish samples were considered valid following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The mercury data presented by Eurofins were determined to be 100% complete and valid prior to the identification of improper homogenization. The validated mercury laboratory data are tabulated and presented in Attachment A-1.

Attachment B presents the LCS SRM recovery results for mercury.

3A2.1.2 PCBs

The following items were reviewed for compliancy in the PCB analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- MS/MSD precision and accuracy
- LCS and LCS SRM recoveries
- Laboratory method blank contamination
- Initial calibrations
- Verification calibrations
- Chromatogram quality
- Sample result verification and identification
- Field duplicate precision
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of surrogate recoveries, MS/MSD precision and accuracy, LCS and LCS SRM recoveries, sample result identifications, and field duplicate precision as discussed below.

Surrogate Recoveries

All sample surrogate recoveries were considered acceptable and within QC limits with the exception of the surrogate recoveries for tetrachloro-m-xylenes (QC limit 53-140%R) in samples OL-3234-11 (46%R, 46%R), OL-3235-01 (61%R, 63%R), -02 (13%R, 13%R), -04 (55%R, 62%R), OL-3237-03 (16%R, 16%R), OL-3220-06F (60%R, 61%R), -09F (56%R, 58%R), OL-3222-11F (63%R), OL-3220-17F (63%R, 59%R), OL-3222-15F (45%R, 42%R), and OL-3229-01F (59%R, 50%R); and decachlorobiphenyl (QC limit 64-122%R) in samples OL-3235-02 (39%R, 41%R), OL-3237-03 (28%R, 29%R), OL-3220-09F (60%R), OL-3226-09F (60%R), OL-3220-08F (167%R), -17F (59%R, 63%R), OL-3223-01F (206%R), OL-3222-15F (50%R), OL-3229-01F (55%R, 57%R), and OL-3223-04F (124%R). Validation qualification of these samples was not required with the exception of OL-3235-02, OL-

3237-03, OL-3220-17F, OL-3222-15F, and OL-3229-01F. Results were considered estimated, possibly biased low, with positive results qualified "J" and nondetected results qualified "UJ" for these affected samples.

MS/MSD Precision and Accuracy

All MS/MSD precision (relative percent difference; RPD) and accuracy (percent recovery; %R) measurements were considered acceptable and within QC limits for designated spiked project samples with the exception of the 0% MS/MSD accuracy results for PCB-1242 during the spiked analyses of sample OL-3227-01; the low MS accuracy results for PCB-1248 (31%R; QC limit 70-130%R) and total PCBs (18%R; QC limit 70-130%R) during the spiked analyses of sample OL-3234-09; the low MS/MSD accuracy results for PCB-1260 (68%R/-61%R; QC limit 70-130%R) and total PCBs (19%R/-66%R; QC limit 70-130%R) during the spiked analyses of sample OL-3237-05; the high MSD accuracy result for PCB-1248 (141%R; QC limit 70-130%R) during the spiked analyses of sample OL-3222-11F; the low MS accuracy result for PCB-1254 (12%R; QC limit 70-130%R) and the low MSD accuracy result for total PCBs (39%R; QC limit 70-130%R) during the spiked analyses of sample OL-3220-04F; the 0% MS/MSD accuracy results for PCB-1254 during the spiked analyses of sample OL-3229-05F; the low MS/MSD accuracy results for total PCBs (56%R/45%R; QC limit 70-130%R) during the spiked analyses of sample OL-3226-07F; and the low MS/MSD accuracy results for PCB-1260 (50%R/56%R; QC limit 70-130%R) and total PCBs (41%R/46%R; QC limit 70-130%R) during the spiked analyses of sample OL-3230-04F. Validation qualification was not required for the affected parent samples with the exception of OL-3227-01, OL-3237-05, OL-3229-05F, OL-3226-07F, and OL-3230-04F. Results for these compounds were considered estimated with positive results qualified "J" and nondetected results qualified "UJ" for the affected parent samples.

LCS and LCS SRM Recoveries

All LCS recoveries were considered acceptable and within the 70-130%R QC limit with the exception of the low LCS recoveries for PCB-1248 and total PCBs (61%R) associated with samples in SDG 410-10894-1. Therefore, associated results were considered estimated, possibly biased low, with positive results qualified "J-" and nondetected results qualified "UJ" for the affected samples.

ALL LCS SRM recoveries were considered acceptable and within the 70-130%R QC limit with the exception of the LCS SRM recoveries for total PCBs associated with samples in SDGs 410-10903-1 (61%R) and 410-3728-6 (39%R). Therefore, all results were considered estimated, possibly biased low, with positive results qualified "J-" and nondetected results qualified "UJ" for the affected samples.

It was noted that samples in SDG 410-10903-1 were reextracted and reanalyzed with the LCS SRM yielding a lower recovery (44%R). Results from the original analysis were reported for this SDG since both sets of data results had similar PCB concentrations.

It was also noted that samples in SDG 410-3728-6 were reextracted and reanalyzed with an improved LCS SRM recovery (68%R). Results from the original analysis were reported for this SDG since original result PCB concentrations were higher and results from the reanalysis would also be considered estimated, possibly biased low.

Sample Result Identifications

All positive PCB sample results were within retention time windows and verified present using secondary column confirmation. The precision (%RPD) between the PCB results on the quantitation and confirmation columns were less than 40% with the exception of PCB-1242 in sample OL-3222-04F (50.5%RPD); PCB-1254 in samples OL-3220-02F (43.1%RPD), OL-3223-11F (53.2%RPD), OL-3230-03F (48.6%RPD), OL-3220-04F (40.3%RPD), OL-3223-06F (45.2%RPD), -09F (48.3%RPD), OL-3224-01F (43.3%RPD), and -04F (41.5%RPD); and PCB-1260 in samples OL-3221-03 (45.7%RPD), -04 (51.7%RPD), -05 (55.1%RPD), -06 (44.3%RPD), -08 (44.2%RPD), OL-3231-04 (43.0%RPD), OL-3234-02 (47.2%RPD), -09 (40.3%RPD), -14 (41.0%RPD), OL-3235-03 (44.5%RPD), OL-3220-08F (71.2%RPD), -11F (31.5%RPD), OL-3223-01F (75.5%RPD), -05F (52.1%RPD), OL-3222-02F (72.9%RPD), -15F (58.5%RPD), -20F (72.1%RPD), OL-3224-02F (52.9%RPD), OL-3225-02F (70.7%RPD), OL-

3230-05F (44.8%RPD), OL-3220-19F (53.0%RPD), OL-3226-06F (51.2%RPD), -10F (51.3%RPD), OL-3228-05F (44.0%RPD), OL-3220-16F (83.5%RPD), OL-3228-01F (50.3%RPD), and OL-3236-02F (57.4%RPD). The results for these compounds were considered estimated and qualified "J" for the affected samples.

In August 2024, it was noted that the total PCB result for sample OL-3238-01F was reported by the laboratory as not detected even though PCB-1254 was detected at a concentration of 8.5 J ppb. Since this concentration is below the laboratory's method detection limit (MDL) for total PCBs, the laboratory information management system (LIMS) reported total PCBs as non-detect at the sample reporting limit (RL) (i.e., 34 U ppb). As a result of this finding, this DUSR is revised to report total PCBs as 8.5 J ppb for this sample. In November 2024, it was noted that the total PCB result for OL-3222-01F reported by the laboratory was calculated incorrectly. As a result of this finding, this DUSR is revised to report total PCBs as 1.9 J ppb for this sample.

Field Duplicate Precision

All field duplicate precision results were considered acceptable with the exception of the precision results for PCB-1260 and total PCBs associated with sample OL-3231-05 and its duplicate OL-3231-05DUP; PCB-1248 and total PCBs associated with sample OL-3234-04 and its duplicate OL-3234-04DUP; and PCB-1260 associated with sample OL-3223-04F and its duplicate OL-3223-04FDUP. Therefore, the results for these compounds were considered estimated and qualified "J" for the affected parent samples.

Usability

Prior to the identification of improper homogenization, all PCB sample results for the fish samples were considered valid following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The PCB data presented by Eurofins were determined to be 100% complete and valid prior to the identification of improper homogenization. The validated data are tabulated and presented in Attachment A-1.

Attachment B presents the LCS SRM recovery and field duplicate precision results for PCBs.

3A2.1.3 Hexachlorobenzene, 4,4'-DDT, and Metabolites

The following items were reviewed for compliancy in the hexachlorobenzene, 4,4'-DDT, and metabolites analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- MS/MSD precision and accuracy
- LCS and LCS SRM recoveries
- Laboratory method blank contamination
- Initial calibrations
- Verification calibrations
- 4,4'-DDT breakdown
- Chromatogram quality
- Sample result verification and identification
- Field duplicate precision
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exceptions of surrogate recoveries, MS/MSD precision and accuracy, LCS and LCS SRM recoveries, blank contamination, verification calibrations, and sample result identifications as discussed below.

Surrogate Recoveries

All sample surrogate recoveries were considered acceptable and within QC limits with the exception of the surrogate recoveries for decachlorobiphenyl (QC limit 36-130%R) in samples OL-3231-08 (28%R), OL-3232-01 (12%R), OL-3220-09F (154%R), -10F (156%R), -12F (146%R), -20F (146%R), OL-3223-15F (146%R, 183%R), OL-3222-16F (245%R, 278%R), OL-3220-04F (179%R), OL-3223-03F (141%R), -06F (146%R), -09F (140%R), OL-3222-03F (132%R), -07F (151%R), -10F (138%R), -14F (144%R), OL-3225-03F (143%R), OL-3226-02F (139%R), -04F (140%R), -09F (135%R), OL-3236-03F (147%R), OL-3220-08F (254%R), OL-3223-01F (327%R), OL-3222-20F (142%R), OL-3224-02F (131%R), OL-3226-03F (140%R), -08F (151%R, 150%R), OL-3228-04 (132%R), OL-3229-01F (136%R), OL-3220-19F (139%R, 183%R), OL-3223-04F (136%R, 132%R), OL-3222-09F (134%R), -13F (137%R, 139%R), -18F (133%R), OL-3225-04F (136%R, 131%R), OL-3226-05F (162%R, 162%R), -06F (143%R, 200%R), -10F (134%R, 144%R), OL-3228-05F (154%R, 158%R), OL-3236-01F (147%R, 135%R), and OL-3238-01F (139%R, 131%R), OL-3220-16F (136%R), OL-3223-12F (132%R), OL-3222-01F (140%R), OL-3228-02F (136%R), OL-3220-15F (133%R), OL-3223-07F (208%R), -08F (138%R, 150%R), OL-3228-01F (135%R, 153%R), and OL-3229-04F (149%R, 187%R); and tetrachloro-m-xylene (QC limit 17-128%R) in samples OL-3220-09F (130%R), -10F (130%R), -12F (129%R), OL-3223-15F (156%R), OL-3222-16F (214%R), OL-3222-10F (140%R), OL-3220-05F (177%R), OL-3225-02F (162%R), and OL-3226-05F (132%R). Validation qualification was not required for the affected samples with the exception of OL-3222-10F. Sample results were considered estimated, possibly biased high, and qualified "J+" for this affected sample.

MS/MSD Precision and Accuracy

All MS/MSD precision and accuracy measurements for spiked compounds were considered acceptable and within QC limits for designated spiked project samples with the exception of the MS/MSD accuracy results for 4,4'-DDD (138%R/64%R; QC limit 70-130%R) and 4,4'-DDE (22%R – MSD; QC limit 57-115%R) during the spiked analyses of sample OL-3227-01; the high MS/MSD accuracy results for 4,4'-DDD (182%R/128%R; QC limit 61-123%R), 4,4'-DDE (227%R/150%R; QC limit 57-115%R), and 4,4'-DDT (159%R – MS; QC limit 77-135%R) during the spiked analyses of sample OL-3237-05; the high MS/MSD accuracy results for hexachlorobenzene (192%R/145%R; QC limit 70-130%R) during the spiked analyses of sample OL-3223-04F; and the high MS/MSD accuracy results for hexachlorobenzene (137%R/137%R; QC limit 70-130%R) during the spiked analyses of sample OL-3230-04F. Validation qualification was not required for the affected parent samples with the exception of 4,4'-DDE associated with sample OL-3237-05 and hexachlorobenzene associated with sample OL-3230-04F. These results were considered estimated and qualified "J" for the affected parent samples.

LCS and LCS SRM Recoveries

All LCS recoveries were considered acceptable and within QC limits with the exception of the high LCS recoveries for hexachlorobenzene (190%R, 5657%R; QC limit 70-130%R) associated with samples in SDGs 410-10903-1 and 410-3728-4. Validation qualification was not required for the affected samples.

All LCS SRM recoveries were considered acceptable and with the 70-130%R QC limit with the exception of the low LCS SRM recoveries for hexachlorobenzene (40%R) and 4,4'-DDD (45.9%R) associated with samples in SDG 410-10903-1; and hexachlorobenzene (50%R) associated with samples in SDG 410-3728-6. Therefore, results for these compounds were considered estimated, possibly biased low, with positive results qualified "J-" and nondetected results qualified "UJ" for the affected samples.

It was noted that samples in SDGs 410-10903-1 and 410-3728-6 were reextracted and reanalyzed yielding improved LCS SRM recoveries. However, since the reanalyzed samples were extracted 18-19 days past the 14-day holding time requirement, original sample results were reported for these SDGs.

Blank Contamination

The laboratory method blank associated with samples in SDG 410-3728-1 contained hexachlorobenzene below the reporting limit at a concentration of 0.775 µg/kg; the laboratory method blank associated with samples in SDG 410-10894-1 contained 4,4'-DDT and 4,4'-DDE below the reporting limit at concentrations of 2.76 and 1.31 µg/kg; the laboratory homogenization blank associated with samples in SDG 410-10894-1 contained 4,4'-DDT below the reporting limit at a concentration of 0.0064 µg/L; and the laboratory homogenization blank associated with samples in SDG 410-3728-2 contained hexachlorobenzene below the reporting limit at a concentration of 0.0086 µg/L. Therefore, results for these compounds less than validation action concentrations were considered not detected and qualified "U" for the affected samples.

Verification Calibrations

All continuing calibration verifications were considered acceptable with percent differences (%Ds) within ±20% with the exception of 4,4'-DDT (28.4%D, 26.9%D, 27.9%D, 28.5%D) associated with samples in SDG 410-3728-1; and hexachlorobenzene (24.5%D, 25.4%D) associated with samples OL-3220-19F, OL-3222-09F, and -13F. Therefore, results for these compounds were considered estimated with positive results qualified "J" and nondetected results qualified "UJ" for the affected samples.

Sample Result Identifications

All positive pesticide sample results were within retention time windows and verified present using secondary column confirmation. The precision (%RPD) between the pesticide results on the quantitation and confirmation columns were less than 40% with the exception of hexachlorobenzene in samples OL-3221-01 (84.4%RPD), -02 (53.6%RPD), -05 (137.4%RPD), -06 (63.3%RPD), -07 (131.4%RPD), -08 (119.5%RPD), OL-3227-01 (60.4%RPD), OL-3234-08 (171%RPD), -14 (141.5%RPD), -16 (40.5%RPD), -17 (148.8%RPD), OL-3225-01F (59.1%RPD), OL-3228-06F (57.8%RPD), OL-3222-06F (47.7%RPD), and OL-3230-04F (126.2%RPD); and 4,4'-DDE in samples OL-3234-04 (49.3%RPD), -19 (76.5%RPD), -20 (54.1%RPD), and OL-3235-01 (48.9%RPD). Therefore, the results for these compounds were considered estimated and qualified "J" for the affected samples. Results for those compounds where the precision exceeded 90%RPD were considered estimated, tentatively identified, and qualified "JN" for the affected samples.

Usability

Prior to the identification of improper homogenization, all hexachlorobenzene, 4,4'-DDT, and metabolite sample results for the fish samples were considered valid following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The hexachlorobenzene, 4,4'-DDT, and metabolite data presented by Eurofins were determined to be 100% complete and valid prior to the identification of improper homogenization. The validated data are tabulated and presented in Attachment A-1.

Attachment B presents the LCS SRM recovery and field duplicate precision results for hexachlorobenzene, 4,4'-DDT, and metabolites.

3A2.1.4 Dioxins and Furans

The following items were reviewed for compliancy in the dioxin and furan analysis:

- Custody documentation
- Holding times
- Surrogate recoveries

- MS/MSD precision and accuracy
- LCS and LCS SRM recoveries
- Laboratory method blank contamination
- Initial calibrations
- Verification calibrations
- Internal standard recoveries
- Chromatogram quality
- Sample result verification and identification
- Field duplicate precision
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of surrogate recoveries, LCS SRM recoveries, and blank contamination as discussed below.

Surrogate Recoveries

All sample surrogate recoveries were considered acceptable and within the 40-135%R QC limit with the exception of the low surrogate recoveries for 13C-2,3,7,8-TCDF in samples OL-3220-07F (32%R), OL-3230-05F (39%R), OL-3238-04F (35%R), and OL-3222-01F (39%R); 13C-2,3,7,8-TCDD in samples OL-3238-04F (33%R), OL-3222-01F (36%R), and OL-3220-16F (37%R); 13C-1,2,3,7,8-PeCDF in samples OL-3220-07F (31%R), OL-3238-04F (33%R), OL-3222-01F (37%R), and OL-3220-16F (39%R); 13C-2,3,4,7,8-PeCDF in samples OL-3220-07F (34%R), OL-3238-04F (35%R), and OL-3222-01F (38%R); 13C-1,2,3,7,8-PeCDD in samples OL-3220-07F (35%R), OL-3238-04F (33%R), OL-3222-01F (35%R), OL-3220-16F (38%R), and -14F (39%R); 13C-1,2,3,4,7,8-HxCDF in samples OL-3238-04F (38%R) and OL-3222-01F (39%R); 13C-1,2,3,6,7,8-HxCDF in samples OL-3238-04F (39%R) and OL-3222-01F (39%R); 13C-2,3,4,6,7,8-HxCDF in samples OL-3230-05F (33%R), OL-3238-04F (37%R), and OL-3220-16F (39%R); 13C-1,2,3,4,7,8-HxCDD in samples OL-3220-07F (39%R) and OL-3238-04F (37%R); 13C-1,2,3,6,7,8-HxCDD in samples OL-3238-04F (37%R) and OL-3222-01F (39%R); 13C-1,2,3,7,8,9-HxCDD in samples OL-3238-04F (36%R) and OL-3222-01F (39%R); 13C-1,2,3,7,8,9-HxCDF in sample OL-3238-04F (37%R); 13C-1,2,3,4,6,7,8-HpCDF in samples OL-3238-04F (38%R) and OL-3222-01F (38%R); 13C-1,2,3,4,6,7,8-HpCDD in sample OL-3238-04F (39%R); 13C-OCDD in sample OL-3220-08F (39%R); and 13C-OCDF in sample OL-3230-05F (39%R). Therefore, associated results were considered estimated, possibly biased low with positive results qualified “J-” and nondetected results qualified “UJ” for the affected samples.

LCS SRM Recoveries

All LCS SRM recoveries were considered acceptable and within the 70-130%R QC limit with the exception of the high LCS SRM recoveries for 1,2,3,7,8-PeCDD (248%R), 1,2,3,7,8-PeCDF (140%R), and OCDD (199%R) associated with all samples in SDG 410-3728-4 except OL-3220-05F, -07F, -17F, and OL-3230-05F; 1,2,3,4,7,8-HxCDD (296%R) and 2,3,7,8-TCDF (181%R) associated with samples OL-3220-07F and -17F; 1,2,3,6,7,8-HxCDD (146%R), 1,2,3,7,8-PeCDD (278%R), and OCDD (140%R) associated with samples OL-3220-05F and OL-3230-05F; 1,2,3,4,6,7,8-HpCDD (146%R), 1,2,3,6,7,8-HxCDD (136%R), 1,2,3,7,8-PeCDD (288%R), 1,2,3,7,8-PeCDF (151%R), and OCDD (165%R) associated with all samples in SDG 410-3728-5; and 1,2,3,4,7,8-HxCDD (289%R), 1,2,3,7,8-PeCDF (133%R), and OCDD (136%R) associated with all samples in SDG 410-3728-6. Therefore, positive results for these compounds were considered estimated, possibly biased high, and qualified “J+” for the affected samples.

Blank Contamination

There were many trace level dioxin and furans detected in laboratory method blanks associated with project samples; the laboratory equipment homogenization blank associated with samples in SDG 410-3728-4 contained 1,2,3,4,7,8,9-HpCDF, 1,2,3,7,8,9-HxCDF, and 2,3,7,8-TCDF below the reporting limit at concentrations of 0.28, 0.20, and 0.33 pg/L, respectively; and the laboratory equipment homogenization blank

associated with samples in SDG 410-3728-6 contained 1,2,3,4,6,7,8-HpCDD, 1,2,3,7,8-PeCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8,9-HxCDF, OCDD, and OCDF below the reporting limit at concentrations of 1.2, 0.35, 0.31, 0.23, 3.2, and 0.69 pg/L, respectively. Therefore, results for these compounds less than validation action concentrations were qualified "B" for the affected samples.

Usability

Prior to the identification of improper homogenization, all dioxin and furan sample results for the fish samples were considered valid following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The dioxin and furan data presented by Eurofins were determined to be 100% complete and valid prior to the identification of improper homogenization. The validated data are tabulated and presented in Attachment A-1.

Attachment B presents the LCS SRM recovery and field duplicate precision results for the dioxin and furan data.

3A2.1.5 Percent Lipids and Percent Moisture

The following items were reviewed for compliancy in the percent lipids and percent moisture analysis:

- Custody documentation
- Holding times
- Laboratory blank contamination
- Laboratory duplicate precision (field duplicate precision equivalent)
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

Prior to the identification of improper homogenization, all percent lipids and percent moisture sample results for the fish samples were considered valid following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The percent lipids and percent moisture data presented by Eurofins were determined to be 100% complete and valid prior to the identification of improper homogenization. The validated laboratory data are tabulated and presented in Attachment A-1.

Attachment B presents the LCS SRM recovery results for percent lipids.

3A2.2 Zooplankton Samples

Data review has been completed for data packages generated by Eurofins containing zooplankton samples collected from the site. The specific samples contained in these data packages, the analyses performed, and the validated laboratory data were tabulated and are presented in Attachment A-2. All of these samples were shipped under a COC record and received intact by the analytical laboratory.

Data validation was performed for all samples in accordance with the project work plan and QAPP as well as the USEPA Region II SOP HW-2c, Revision 15 "Mercury and Cyanide Data Validation". This data validation and usability report is presented by analysis type.

3A2.2.1 Low Level Mercury

The following items were reviewed for compliancy in the low level mercury analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration verifications
- Initial and continuing calibration, and laboratory preparation blank contamination
- Matrix spike / matrix spike duplicate (MS/MSD) recoveries
- Laboratory duplicate precision
- Laboratory control sample (LCS) recoveries
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination, MS/MSD recoveries, and LCS recoveries as discussed below.

Blank Contamination

The laboratory preparation blanks associated with project samples contained low level mercury at concentrations ranging 0.165-0.595 ng/g; the laboratory initial calibration blanks associated with project samples contained low level mercury at concentrations ranging 0.069-0.410 ng/L; and laboratory continuing calibration blanks associated with project samples contained low level mercury at concentrations ranging 0.0008-0.679 ng/L. Validation qualification was not required for the associated project samples.

MS/MSD Recoveries

All MS/MSD recoveries were considered acceptable and within QC limits for designated spiked project samples with the exception of the low MS recovery for mercury (55.8%R; QC limit 71-125%R) associated with sample OL-3532-01. Therefore, the low level mercury result was considered estimated and qualified "J" for the affected parent sample.

LCS Recoveries

All LCS recoveries were considered acceptable and within the 75-125%R QC limit with the exception of the high LCS recovery for mercury (135%R) associated with sample OL-3510-01. Validation qualification was not required for the affected sample.

Usability

All low level mercury sample results for the zooplankton samples were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The low level mercury data presented by Eurofins were 100% complete (i.e., usable). The validated low level mercury laboratory data are tabulated and presented in Attachment A-2.

It was noted that samples OL-3502-01, OL-3559-01, OL-3563-01, OL-3567-01, OL-3571-01, OL-3575-01, OL-3579-01, OL-3583-01, and OL-3587-01 were not analyzed by the laboratory for low level mercury due to limited volume. As a result, the low level mercury analysis was cancelled for these samples.

3A2.2.2 Methyl Mercury

The following items were reviewed for compliancy in the methyl mercury analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Initial and continuing calibration verifications
- Initial and continuing calibration, and laboratory preparation blank contamination
- Matrix spike / matrix spike duplicate (MS/MSD) recoveries
- Laboratory duplicate precision
- Laboratory control sample (LCS) recoveries
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination and LCS recoveries as discussed below.

Blank Contamination

The laboratory initial calibration blanks associated with project samples contained methyl mercury at concentrations ranging 0.004-0.192 ng/L; the laboratory continuing calibration blanks associated with project samples contained methyl mercury at concentrations ranging 0.0001-0.121 ng/L; and the laboratory preparation blanks associated with project samples contained methyl mercury at concentrations ranging 0.5-2.0 ng/g. Validation qualification was not required for the affected samples.

LCS Recoveries

All LCS recoveries were considered acceptable and within the 50-150%R QC limit with the exception of the low LCS recoveries for methyl mercury (34.3%R, 46.5%R, 27.2%R) associated with samples OL-3532-01, OL-3571-01, and OL-3575-01. Therefore, the methyl mercury sample results which were nondetects were considered estimated and qualified “UJ” for the affected samples.

Usability

All methyl mercury sample results for the zooplankton samples were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The methyl mercury data presented by Eurofins were 100% complete (i.e., usable). The validated methyl mercury laboratory data are tabulated and presented in Attachment A-2.

It was noted that sample OL-3575-01 contained limited volume for digestion thereby elevating the detection limit.

ATTACHMENT A – VALIDATED LABORATORY DATA

ATTACHMENT A-1 – VALIDATED LABORATORY DATA FOR FISH SAMPLES

			Location ID	OL-F-1A		OL-F-2A		OL-F-2A		OL-F-2A	
			Field Sample ID	OL-3221-08		OL-3221-06		OL-3231-01		OL-3231-02	
			Sample Name	OL-F-1A-20-WHS-01		OL-F-2A-20-WHS-01		OL-F-2A-20-SHRH-01		OL-F-2A-20-SHRH-02	
			Sampled	5/21/2020		5/22/2020		7/22/2020		7/22/2020	
			Lab Sample ID	410-3728-29		410-3728-27		410-9221-1		410-9221-2	
			Taxonomic	WHS		WHS		SHRH		SHRH	
			Age (yrs)								
			Gender	F		M		M		F	
			Length (mm)	521		510		316		437	
			Weight (g)	1761		1480		338		965	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	71.9		72.5		NRQ		69.9	
SW3540M	LIPIDS	%Lipids Determination	%	7.1		7.7		NRQ		6.7	
SW7471	7439-97-6	Mercury	mg/kg	0.047	U	0.13		NRQ		0.094	J
SW8081	72-54-8	4,4'-DDD	ug/kg	3.8	J	17	U	NRQ		4.7	J
SW8081	72-55-9	4,4'-DDE	ug/kg	15	J	15	J	NRQ		20	
SW8081	50-29-3	4,4'-DDT	ug/kg	17	UJ	17	UJ	NRQ		17	UJ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	8.3	UJ	8.3	UJ	NRQ		8.2	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	34	U	NRQ		34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	34	U	NRQ		34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	34	U	NRQ		34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	34	U	NRQ		34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	67		50		NRQ		130	
SW8082	11097-69-1	Aroclor-1254	ug/kg	63		89		NRQ		170	
SW8082	11096-82-5	Aroclor-1260	ug/kg	51	J	83	J	NRQ		150	
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	34	U	NRQ		34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	34	U	NRQ		34	U
Calculated	PCB	Total PCBs	ug/kg	180		220		NRQ		450	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-2A		OL-F-3A		OL-F-3A		OL-F-3A	
			Field Sample ID	OL-3231-03		OL-3221-01		OL-3227-01		OL-3231-07	
			Sample Name	OL-F-2A-20-SHRH-03		OL-F-3A-20-WHS-01		OL-F-3A-20-WHS-02		OL-F-3A-20-SHRH-01	
			Sampled	7/22/2020		5/19/2020		6/30/2020		7/28/2020	
			Lab Sample ID	410-9221-3		410-3728-22		410-6500-12		410-9221-7	
			Taxonomic	SHRH		WHS		WHS		SHRH	
			Age (yrs)								
			Gender	M		M		F		F	
			Length (mm)	433		512		530		461	
			Weight (g)	890		1560		1583		1149	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	66.5		73		66.8		69.6	
SW3540M	LIPIDS	%Lipids Determination	%	8.2		7		6.3		8.6	
SW7471	7439-97-6	Mercury	mg/kg	0.12		0.19		0.14	J	0.22	
SW8081	72-54-8	4,4'-DDD	ug/kg	6.9	J	3.5	J	17	U	17	U
SW8081	72-55-9	4,4'-DDE	ug/kg	30		16	J	8.2	J	11	J
SW8081	50-29-3	4,4'-DDT	ug/kg	17	UJ	17	UJ	17	UJ	17	UJ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	8.3	U	8.3	UJ	8.2	UJ	59	
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	33	U	34	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	33	U	34	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	33	U	34	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	33	U	34	UJ	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	110		33	U	49		55	
SW8082	11097-69-1	Aroclor-1254	ug/kg	160		110		54		110	
SW8082	11096-82-5	Aroclor-1260	ug/kg	220		33	U	33	J	180	
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	33	U	34	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	33	U	34	U	34	U
Calculated	PCB	Total PCBs	ug/kg	490		110		140		350	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-3A		OL-F-4A		OL-F-4A		OL-F-5A	
			Field Sample ID	OL-3231-08		OL-3221-07		OL-3231-04		OL-3221-09	
			Sample Name	OL-F-3A-20-SHRH-02		OL-F-4A-20-WHS-01		OL-F-4A-20-SHRH-01		OL-F-5A-20-WHS-01	
			Sampled	7/29/2020		6/4/2020		7/23/2020		5/27/2020	
			Lab Sample ID	410-9221-8		410-3728-28		410-9221-4		410-3728-30	
			Taxonomic	SHRH		WHS		SHRH		WHS	
			Age (yrs)								
			Gender	F		F		M		F	
			Length (mm)	432		521		447		516	
			Weight (g)	926		1447		1027		1250	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	65.6		69.7		68.1		69.8	
SW3540M	LIPIDS	%Lipids Determination	%	9.6		7.4		9.4		6.9	
SW7471	7439-97-6	Mercury	mg/kg	0.046	U	0.39		0.22		0.22	
SW8081	72-54-8	4,4'-DDD	ug/kg	5.3	J	4.3	J	34	U	17	U
SW8081	72-55-9	4,4'-DDE	ug/kg	27		19		49		9.4	J
SW8081	50-29-3	4,4'-DDT	ug/kg	17	UJ	17	UJ	34	UJ	17	UJ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	8.3	U	8.3	UJ	11	J	8.2	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	34	U	33	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	34	U	33	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	34	U	33	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	34	U	33	U	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	120		88		45		38	
SW8082	11097-69-1	Aroclor-1254	ug/kg	190		110		88		46	
SW8082	11096-82-5	Aroclor-1260	ug/kg	150		100		75	J	75	
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	34	U	33	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	34	U	33	U	34	U
Calculated	PCB	Total PCBs	ug/kg	460		300		210		160	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-5A		OL-F-5A		OL-F-5B		OL-F-5B	
			Field Sample ID	OL-3231-05		OL-3231-06		OL-3221-02		OL-3221-03	
			Sample Name	OL-F-5A-20-SHRH-01		OL-F-5A-20-SHRH-02		OL-F-5B-20-WHS-01		OL-F-5B-20-WHS-02	
			Sampled	7/27/2020		7/27/2020		5/20/2020		5/20/2020	
			Lab Sample ID	410-9221-5		410-9221-6		410-3728-23		410-3728-24	
			Taxonomic	SHRH		SHRH		WHS		WHS	
			Age (yrs)								
			Gender	F		F		F		F	
			Length (mm)	492		480		530		541	
			Weight (g)	1169		1127		1700		1854	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	63.8		69.7		70.7		67.2	
SW3540M	LIPIDS	%Lipids Determination	%	6.4		2.9		6.8		5.4	
SW7471	7439-97-6	Mercury	mg/kg	0.11	J	0.17		0.13		0.16	
SW8081	72-54-8	4,4'-DDD	ug/kg	8.1	J	17	U	17	U	17	U
SW8081	72-55-9	4,4'-DDE	ug/kg	76		19		13	J	11	J
SW8081	50-29-3	4,4'-DDT	ug/kg	17	UJ	17	UJ	17	UJ	17	UJ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	8.2	U	8.1	U	8.3	UJ	41	
SW8082	12674-11-2	Aroclor-1016	ug/kg	33	U	34	U	34	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	33	U	34	U	34	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	33	U	34	U	34	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	33	U	34	U	34	U	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	93		74		34	U	71	
SW8082	11097-69-1	Aroclor-1254	ug/kg	180		110		91		82	
SW8082	11096-82-5	Aroclor-1260	ug/kg	180	J	100		150		68	J
SW8082	37324-23-5	Aroclor-1262	ug/kg	33	U	34	U	34	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	33	U	34	U	34	U	34	U
Calculated	PCB	Total PCBs	ug/kg	450	J	280		240		220	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-6A		OL-F-6A		OL-F-7A
			Field Sample ID	OL-3221-04		OL-3221-05		OL-3232-01
			Sample Name	OL-F-6A-20-WHS-01		OL-F-6A-20-WHS-02		OL-F-7A-20-WHS-01
			Sampled	5/21/2020		5/21/2020		7/30/2020
			Lab Sample ID	410-3728-25		410-3728-26		410-10901-1
			Taxonomic	WHS		WHS		WHS
			Age (yrs)					
			Gender	M		F		M
			Length (mm)	543		483		450
			Weight (g)	1791		1553		973
Method	Parameter Code	Parameter Name	Units					
ASTM D2216	MOISTURE-%	Percent Moisture	%	73.3		67.6		NRQ
SW3540M	LIPIDS	%Lipids Determination	%	6.7		10		NRQ
SW7471	7439-97-6	Mercury	mg/kg	0.18		0.16		NRQ
SW8081	72-54-8	4,4'-DDD	ug/kg	4.7	J	6.4	J	NRQ
SW8081	72-55-9	4,4'-DDE	ug/kg	19		26		NRQ
SW8081	50-29-3	4,4'-DDT	ug/kg	17	UJ	17	UJ	NRQ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	8.3	U	8.2	UJ	NRQ
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	33	U	NRQ
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	33	U	NRQ
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	33	U	NRQ
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	33	U	NRQ
SW8082	12672-29-6	Aroclor-1248	ug/kg	160		170		NRQ
SW8082	11097-69-1	Aroclor-1254	ug/kg	270		170		NRQ
SW8082	11096-82-5	Aroclor-1260	ug/kg	190	J	110	J	NRQ
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	33	U	NRQ
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	33	U	NRQ
Calculated	PCB	Total PCBs	ug/kg	620		450		NRQ

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-1A		OL-F-1A		OL-F-1A		OL-F-2A	
			Field Sample ID	OL-3234-01		OL-3234-02		OL-3234-03		OL-3234-04	
			Sample Name	OL-F-1A-20-RG-01		OL-F-1A-20-RG-02		OL-F-1A-20-RG-03		OL-F-2A-20-RG-01	
			Sampled	8/5/2020		8/7/2020		8/7/2020		8/6/2020	
			Lab Sample ID	410-10894-1		410-10894-2		410-10894-3		410-10894-4	
			Taxonomic	RG		RG		RG		RG	
			Age (yrs)								
			Gender	U		U		U		U	
			Length (mm)	57		73		65		72	
			Weight (g)	152		115		125		177	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	76.3		76.2		75.8		76.5	
SW3540M	LIPIDS	%Lipids Determination	%	2.7		2.5		2.4		2.4	
SW7471	7439-97-6	Mercury	mg/kg	0.064	J	0.074	J	0.068	J	0.063	J
SW8081	72-54-8	4,4'-DDD	ug/kg	3.4	U	3.4	U	3.3	U	3.4	U
SW8081	72-55-9	4,4'-DDE	ug/kg	1.8	J	2.1	J	1.7	J	3.4	UJ
SW8081	50-29-3	4,4'-DDT	ug/kg	3.4	U	3.4	UJ	3.3	U	3.4	U
SW8081	118-74-1	Hexachlorobenzene	ug/kg	1.7	U	1.7	U	1.6	U	1.7	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	33	U	34	U	33	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	33	U	34	U	33	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	33	U	34	U	33	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	33	U	34	U	33	U	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	35	J-	32	J	23	J	49	J-
SW8082	11097-69-1	Aroclor-1254	ug/kg	30	J	31	J	25	J	43	
SW8082	11096-82-5	Aroclor-1260	ug/kg	31	J	18	J	33	U	43	
SW8082	37324-23-5	Aroclor-1262	ug/kg	33	U	34	U	33	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	33	U	34	U	33	U	34	U
Calculated	PCB	Total PCBs	ug/kg	96	J-	81	J-	48	J-	140	J-

			Location ID	OL-F-2A		OL-F-2A		OL-F-3A		OL-F-3A	
			Field Sample ID	OL-3234-05		OL-3234-06		OL-3234-07		OL-3234-08	
			Sample Name	OL-F-2A-20-MIN-01		OL-F-2A-20-MIN-02		OL-F-3A-20-RG-01		OL-F-3A-20-MIN-01	
			Sampled	8/10/2020		8/10/2020		8/5/2020		8/5/2020	
			Lab Sample ID	410-10894-5		410-10894-6		410-10894-7		410-10894-8	
			Taxonomic	MIN		MIN		RG		MIN	
			Age (yrs)								
			Gender	U		U		U		U	
			Length (mm)	54		52		63		64	
			Weight (g)	103		114		120		118	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	76.4		76.7		75.7		74.6	
SW3540M	LIPIDS	%Lipids Determination	%	3.3		3		3.2		4.4	
SW7471	7439-97-6	Mercury	mg/kg	0.08	J	0.078	J	0.063	J	0.11	
SW8081	72-54-8	4,4'-DDD	ug/kg	3.4	U	3.4	U	3.3	U	3.3	U
SW8081	72-55-9	4,4'-DDE	ug/kg	1.6	J	2	J	3.3	U	2.5	J
SW8081	50-29-3	4,4'-DDT	ug/kg	3.4	U	3.4	U	3.3	U	3.3	U
SW8081	118-74-1	Hexachlorobenzene	ug/kg	1.7	U	1.1	J	1.6	U	0.48	JN
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	33	U	33	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	33	U	33	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	33	U	33	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	33	U	33	U	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	30	J	37	J-	39	J-	34	UJ
SW8082	11097-69-1	Aroclor-1254	ug/kg	25	J	35		39		25	J
SW8082	11096-82-5	Aroclor-1260	ug/kg	31	J	36		25	J	34	U
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	33	U	33	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	33	U	33	U	34	U
Calculated	PCB	Total PCBs	ug/kg	86	J-	110	J-	100	J-	25	J

			Location ID	OL-F-3A		OL-F-4A		OL-F-4A		OL-F-4A	
			Field Sample ID	OL-3234-09		OL-3234-10		OL-3234-11		OL-3234-12	
			Sample Name	OL-F-3A-20-RG-02		OL-F-4A-20-MIN-01		OL-F-4A-20-MIN-02		OL-F-4A-20-MIN-03	
			Sampled	8/5/2020		8/6/2020		8/6/2020		8/7/2020	
			Lab Sample ID	410-10894-9		410-10894-10		410-10894-11		410-10894-12	
			Taxonomic	RG		MIN		MIN		MIN	
			Age (yrs)								
			Gender	U		U		U		U	
			Length (mm)	59		47		52		65	
			Weight (g)	183		106		104		127	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	74.3		78.7		77.3		75	
SW3540M	LIPIDS	%Lipids Determination	%	3.2		2.2		3.3		3	
SW7471	7439-97-6	Mercury	mg/kg	0.078	J	0.1	J	0.11	J	0.096	J
SW8081	72-54-8	4,4'-DDD	ug/kg	3.3	U	3.4	U	0.94	J	3.4	U
SW8081	72-55-9	4,4'-DDE	ug/kg	3.3	U	1.6	J	3.3	U	3.4	U
SW8081	50-29-3	4,4'-DDT	ug/kg	3.3	U	3.4	U	3.3	U	3.4	U
SW8081	118-74-1	Hexachlorobenzene	ug/kg	1.3	J	1.6	U	1.6	U	1.6	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	34	U	34	U	33	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	34	U	34	U	33	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	34	U	34	U	33	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	34	U	34	U	33	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	24	J	34	UJ	34	UJ	24	J
SW8082	11097-69-1	Aroclor-1254	ug/kg	24	J	20	J	34	U	20	J
SW8082	11096-82-5	Aroclor-1260	ug/kg	15	J	34	U	34	U	33	U
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	34	U	34	U	33	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	34	U	34	U	33	U
Calculated	PCB	Total PCBs	ug/kg	63	J-	20	J	34	UJ	44	J-

			Location ID	OL-F-5A		OL-F-5A		OL-F-5A		OL-F-5B	
			Field Sample ID	OL-3234-13		OL-3234-14		OL-3234-15		OL-3234-16	
			Sample Name	OL-F-5A-20-RG-01		OL-F-5A-20-RG-02		OL-F-5A-20-MIN-01		OL-F-5B-20-MIN-01	
			Sampled	8/4/2020		8/4/2020		8/4/2020		8/11/2020	
			Lab Sample ID	410-10894-13		410-10894-14		410-10894-15		410-10894-16	
			Taxonomic	RG		RG		MIN		MIN	
			Age (yrs)								
			Gender	U		U		U		U	
			Length (mm)	73		71		52		65	
			Weight (g)	110		114		123		109	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	77.1		77		76.8		75.6	
SW3540M	LIPIDS	%Lipids Determination	%	2		2.3		7.8		3	
SW7471	7439-97-6	Mercury	mg/kg	0.083	J	0.059	J	0.12		0.16	
SW8081	72-54-8	4,4'-DDD	ug/kg	3.4	U	3.3	U	3.3	U	0.68	J
SW8081	72-55-9	4,4'-DDE	ug/kg	2.7	J	2.4	J	3.3	U	2.3	J
SW8081	50-29-3	4,4'-DDT	ug/kg	3.4	U	3.3	U	3.3	U	3.4	U
SW8081	118-74-1	Hexachlorobenzene	ug/kg	1.6	U	0.63	JN	1.6	U	0.46	J
SW8082	12674-11-2	Aroclor-1016	ug/kg	33	U	34	U	33	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	33	U	34	U	33	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	33	U	34	U	33	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	33	U	34	U	33	U	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	22	J	31	J	33	UJ	34	UJ
SW8082	11097-69-1	Aroclor-1254	ug/kg	24	J	31	J	19	J	24	J
SW8082	11096-82-5	Aroclor-1260	ug/kg	23	J	21	J	33	U	20	J
SW8082	37324-23-5	Aroclor-1262	ug/kg	33	U	34	U	33	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	33	U	34	U	33	U	34	U
Calculated	PCB	Total PCBs	ug/kg	69	J-	83	J-	19	J	44	J-

			Location ID	OL-F-5B		OL-F-5B		OL-F-6A		OL-F-6A	
			Field Sample ID	OL-3234-17		OL-3234-18		OL-3234-19		OL-3234-20	
			Sample Name	OL-F-5B-20-MIN-02		OL-F-5B-20-MIN-03		OL-F-6A-20-RG-01		OL-F-6A-20-MIN-01	
			Sampled	8/11/2020		8/11/2020		8/7/2020		8/7/2020	
			Lab Sample ID	410-10894-17		410-10894-18		410-10894-19		410-10894-20	
			Taxonomic	MIN		MIN		RG		MIN	
			Age (yrs)								
			Gender	U		U		U		U	
			Length (mm)	55		55		48		54	
			Weight (g)	109		111		120		119	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	75.3		75.7		77.1		77.3	
SW3540M	LIPIDS	%Lipids Determination	%	2.9		3.3		2.7		3.7	
SW7471	7439-97-6	Mercury	mg/kg	0.13		0.15		0.039	U	0.059	J
SW8081	72-54-8	4,4'-DDD	ug/kg	0.85	J	3.3	U	1.1	J	0.89	J
SW8081	72-55-9	4,4'-DDE	ug/kg	2.2	J	3.3	U	3.4	UJ	1.6	J
SW8081	50-29-3	4,4'-DDT	ug/kg	3.3	U	3.3	U	3.4	U	3.4	U
SW8081	118-74-1	Hexachlorobenzene	ug/kg	0.65	JN	0.88	J	1.7	U	1.7	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	33	U	33	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	33	U	33	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	33	U	33	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	33	U	33	U	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	34	UJ	33	UJ	280	J-	230	J-
SW8082	11097-69-1	Aroclor-1254	ug/kg	24	J	23	J	130		100	
SW8082	11096-82-5	Aroclor-1260	ug/kg	21	J	23	J	43		32	J
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	33	U	33	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	33	U	33	U	34	U
Calculated	PCB	Total PCBs	ug/kg	45	J-	46	J-	450	J-	360	J-

			Location ID	OL-F-3A		OL-F-5B		OL-F-5B		OL-F-5B			
			Field Sample ID	OL-3237-01		OL-3237-02		OL-3237-03		OL-3237-04			
			Sample Name	OL-F-3A-20-SHRH-03		OL-F-5B-20-SHRH-01		OL-F-5B-20-WHS-03		OL-F-5B-20-WHS-04			
			Sampled	8/11/2020		8/20/2020		8/20/2020		8/20/2020			
			Lab Sample ID	410-16344-1		410-16344-2		410-16344-3		410-16344-4			
			Taxonomic	SHRH		SHRH		WHS		WHS			
			Age (yrs)										
			Gender	M		M		M		M			
			Length (mm)	455		262		331		312			
			Weight (g)	1164		198		399		375			
Method	Parameter Code	Parameter Name	Units										
ASTM D2216	MOISTURE-%	Percent Moisture	%	68.1		71.4		75.6		75.8			
SW3540M	LIPIDS	%Lipids Determination	%	9.1		5.9		6		5.8			
SW7471	7439-97-6	Mercury	mg/kg	0.17		0.093	J	0.05	U	0.073	J		
SW8081	72-54-8	4,4'-DDD	ug/kg	36	UJ	18	UJ	72	UJ	18	UJ		
SW8081	72-55-9	4,4'-DDE	ug/kg	34		3.7	J	66	U	5	J		
SW8081	50-29-3	4,4'-DDT	ug/kg	26	J	4.2	J	66	U	3	J		
SW8081	118-74-1	Hexachlorobenzene	ug/kg	30	UJ	15	UJ	61	UJ	15	UJ		
SW8082	12674-11-2	Aroclor-1016	ug/kg	33	UJ	33	UJ	34	UJ	33	UJ		
SW8082	11104-28-2	Aroclor-1221	ug/kg	33	UJ	33	UJ	34	UJ	33	UJ		
SW8082	11141-16-5	Aroclor-1232	ug/kg	33	UJ	33	UJ	34	UJ	33	UJ		
SW8082	53469-21-9	Aroclor-1242	ug/kg	33	UJ	33	UJ	34	UJ	33	UJ		
SW8082	12672-29-6	Aroclor-1248	ug/kg	180	J-	53	J-	35	J-	46	J-		
SW8082	11097-69-1	Aroclor-1254	ug/kg	220	J-	67	J-	24	J	55	J-		
SW8082	11096-82-5	Aroclor-1260	ug/kg	260	J-	55	J-	34	UJ	44	J-		
SW8082	37324-23-5	Aroclor-1262	ug/kg	33	UJ	33	UJ	34	UJ	33	UJ		
SW8082	11100-14-4	Aroclor-1268	ug/kg	33	UJ	33	UJ	34	UJ	33	UJ		
Calculated	PCB	Total PCBs	ug/kg	660	J-	180	J-	60	J-	150	J-		

			Location ID	OL-F-6A		OL-F-6A		OL-F-7A		OL-F-7A		OL-F-7A	
			Field Sample ID	OL-3235-01		OL-3237-05		OL-3235-02		OL-3235-03		OL-3235-04	
			Sample Name	OL-F-6A-20-MIN-02		OL-F-6A-20-WHS-03		OL-F-7A-20-MIN-01		OL-F-7A-20-MIN-02		OL-F-7A-20-RG-01	
			Sampled	8/7/2020		9/8/2020		8/12/2020		8/12/2020		8/12/2020	
			Lab Sample ID	410-10903-1		410-16344-5		410-10903-2		410-10903-3		410-10903-4	
			Taxonomic	MIN		WHS		MIN		MIN		RG	
			Age (yrs)										
			Gender	U		F		U		U		U	
			Length (mm)	76		510		79		76		70	
			Weight (g)	115		1573		107		105		103	
Method	Parameter Code	Parameter Name	Units										
ASTM D2216	MOISTURE-%	Percent Moisture	%	74.7		74.9		76.6		74.9		75.7	
SW3540M	LIPIDS	%Lipids Determination	%	2.9		6.5		2.2		3		2.1	
SW7471	7439-97-6	Mercury	mg/kg	0.057	J	0.25	J	0.096	J	0.15		0.14	
SW8081	72-54-8	4,4'-DDD	ug/kg	18	UJ	18	UJ	18	UJ	18	UJ	36	UJ
SW8081	72-55-9	4,4'-DDE	ug/kg	2.9	J	12	J	3.9	J	5.7	J	8.8	J
SW8081	50-29-3	4,4'-DDT	ug/kg	6.6	J	16	J	3.9	J	4.2	J	11	J
SW8081	118-74-1	Hexachlorobenzene	ug/kg	15	UJ	15	UJ	15	UJ	15	UJ	30	UJ
SW8082	12674-11-2	Aroclor-1016	ug/kg	33	UJ	34	UJ	34	UJ	33	UJ	34	UJ
SW8082	11104-28-2	Aroclor-1221	ug/kg	33	UJ	34	UJ	34	UJ	33	UJ	34	UJ
SW8082	11141-16-5	Aroclor-1232	ug/kg	33	UJ	34	UJ	34	UJ	33	UJ	34	UJ
SW8082	53469-21-9	Aroclor-1242	ug/kg	33	UJ	34	UJ	34	UJ	33	UJ	34	UJ
SW8082	12672-29-6	Aroclor-1248	ug/kg	360	J-	130	J-	34	UJ	35	J-	54	J-
SW8082	11097-69-1	Aroclor-1254	ug/kg	120	J-	220	J-	18	J	41	J-	89	J-
SW8082	11096-82-5	Aroclor-1260	ug/kg	34	J-	340	J-	34	UJ	44	J-	56	J-
SW8082	37324-23-5	Aroclor-1262	ug/kg	33	UJ	34	UJ	34	UJ	33	UJ	34	UJ
SW8082	11100-14-4	Aroclor-1268	ug/kg	33	UJ	34	UJ	34	UJ	33	UJ	34	UJ
Calculated	PCB	Total PCBs	ug/kg	520	J-	690	J-	18	J	120	J-	200	J-

			Location ID	OL-F-1A		OL-F-1A	OL-F-2A		OL-F-2A		OL-F-3A	
			Field Sample ID	OL-3220-11F		OL-3229-05F	OL-3223-01F		OL-3226-03F		OL-3222-15F	
			Sample Name	OL-F-1A-20-WALL-02		OL-F-1A-20-CCP-03	OL-F-2A-20-WALL-04		OL-F-2A-20-CCP-01		OL-F-3A-20-SMB-01	
			Sampled	5/21/2020		7/14/2020	5/22/2020		6/29/2020		6/3/2020	
			Lab Sample ID	410-3728-12		410-7904-5	410-3939-1		410-6500-3		410-3939-32	
			Taxonomic	WALL		CCP	WALL		CCP		SMB	
			Age (yrs)	3+		5+	18+		2+		4+	
			Gender	F		F	M		F		F	
			Length (mm)	485		648	560		468		424	
			Weight (g)	1388		4526	1934		1378		1268	
Method	Parameter Code	Parameter Name	Units									
ASTM D2216	MOISTURE-%	Percent Moisture	%	74.2		NRQ	NRQ		NRQ		77.3	
SW3540M	LIPIDS	%Lipids Determination	%	3.7		NRQ	NRQ		NRQ		2.8	
SW7471	7439-97-6	Mercury	mg/kg	0.34		NRQ	NRQ		NRQ		0.37	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	30	U	NRQ	NRQ		NRQ		31	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	NRQ	NRQ		NRQ		34	UJ
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	NRQ	NRQ		NRQ		34	UJ
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	NRQ	NRQ		NRQ		34	UJ
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	NRQ	NRQ		NRQ		34	UJ
SW8082	12672-29-6	Aroclor-1248	ug/kg	130		NRQ	NRQ		NRQ		47	J-
SW8082	11097-69-1	Aroclor-1254	ug/kg	110		NRQ	NRQ		NRQ		61	J-
SW8082	11096-82-5	Aroclor-1260	ug/kg	66		NRQ	NRQ		NRQ		49	J
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	NRQ	NRQ		NRQ		34	UJ
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	NRQ	NRQ		NRQ		34	UJ
Calculated	PCB	Total PCBs	ug/kg	310		NRQ	NRQ		NRQ		160	J-
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	0.28	J	NRQ	NRQ		NRQ		0.62	J
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	3.6	J	NRQ	NRQ		NRQ		5.1	J
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	0.084	U	NRQ	NRQ		NRQ		0.093	U
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	0.013	U	NRQ	NRQ		NRQ		0.015	U
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	0.021	U	NRQ	NRQ		NRQ		0.02	U
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	0.095	J	NRQ	NRQ		NRQ		0.099	J
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	0.79	J	NRQ	NRQ		NRQ		0.02	U
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	0.014	U	NRQ	NRQ		NRQ		0.015	U
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	0.024	U	NRQ	NRQ		NRQ		0.021	U
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	0.61	J	NRQ	NRQ		NRQ		1	J
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	0.22	J	NRQ	NRQ		NRQ		0.23	J
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	0.022	U	NRQ	NRQ		NRQ		0.02	U
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	0.27	J	NRQ	NRQ		NRQ		0.22	J
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	0.077	J	NRQ	NRQ		NRQ		0.027	J
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	0.96	J	NRQ	NRQ		NRQ		0.063	U
SW8290	3268-87-9	OCDD	NG/KG	0.71	J	NRQ	NRQ		NRQ		2.1	J
SW8290	39001-02-0	OCDF	NG/KG	0.013	U	NRQ	NRQ		NRQ		0.084	J

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-4A		OL-F-4A		OL-F-4A		OL-F-5A		OL-F-5A	
			Field Sample ID	OL-3222-02F		OL-3222-20F		OL-3223-05F		OL-3220-05F		OL-3224-02F	
			Sample Name	OL-F-4A-20-WALL-01		OL-F-4A-20-WALL-02		OL-F-4A-20-SMB-02		OL-F-5A-20-CCP-02		OL-F-5A-20-PKSD-02	
			Sampled	5/28/2020		6/3/2020		6/4/2020		5/18/2020		6/9/2020	
			Lab Sample ID	410-3939-18		410-3939-37		410-3939-6		410-3728-6		410-4044-2	
			Taxonomic	WALL		WALL		SMB		CCP		PKSD	
			Age (yrs)	5+		5+		4+		5+		3+	
			Gender	F		M		M		F		M	
			Length (mm)	511		529		385		669		186	
			Weight (g)	1590		2024		1003		5037		163	
Method	Parameter Code	Parameter Name	Units										
ASTM D2216	MOISTURE-%	Percent Moisture	%	74.2		NRQ		73.6		NRQ		75.7	
SW3540M	LIPIDS	%Lipids Determination	%	4.2		NRQ		3.1		NRQ		2	
SW7471	7439-97-6	Mercury	mg/kg	0.51		NRQ		0.24		NRQ		0.31	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	150	U	NRQ		60	U	NRQ		150	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	NRQ		33	U	NRQ		33	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	NRQ		33	U	NRQ		33	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	NRQ		33	U	NRQ		33	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	NRQ		33	U	NRQ		33	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	190		NRQ		110		NRQ		33	U
SW8082	11097-69-1	Aroclor-1254	ug/kg	150		NRQ		110		NRQ		53	
SW8082	11096-82-5	Aroclor-1260	ug/kg	71	J	NRQ		62	J	NRQ		28	J
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	NRQ		33	U	NRQ		33	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	NRQ		33	U	NRQ		33	U
Calculated	PCB	Total PCBs	ug/kg	410		NRQ		280		NRQ		81	
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	0.37	J	NRQ		0.4	J	NRQ		0.13	J
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	5.2	J	NRQ		4.9	J	NRQ		0.035	U
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	0.11	U	NRQ		0.1	U	NRQ		0.041	U
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	0.021	U	NRQ		0.084	J	NRQ		0.01	U
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	0.023	U	NRQ		0.03	U	NRQ		0.11	J
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	0.18	J	NRQ		0.13	J	NRQ		0.028	J
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	0.022	U	NRQ		0.03	U	NRQ		0.21	J
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	0.019	U	NRQ		0.028	J	NRQ		0.051	J
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	0.025	U	NRQ		0.036	U	NRQ		0.075	J
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	0.13	U	NRQ		1	J	NRQ		0.031	U
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	0.25	J	NRQ		0.22	J	NRQ		0.053	JB
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	0.021	U	NRQ		0.03	U	NRQ		0.0089	U
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	0.34	J	NRQ		0.36	J	NRQ		0.016	U
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	0.12	J	NRQ		0.0079	U	NRQ		0.045	J
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	0.8	J	NRQ		0.096	U	NRQ		0.19	J
SW8290	3268-87-9	OCDD	NG/KG	0.84	J	NRQ		2.7	J	NRQ		0.33	J
SW8290	39001-02-0	OCDF	NG/KG	0.028	JB	NRQ		0.022	U	NRQ		0.11	J

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-5A		OL-F-5A		OL-F-5B		OL-F-5B		OL-F-5B		
			Field Sample ID	OL-3229-01F		OL-3238-02F		OL-3220-08F		OL-3220-17F		OL-3228-03F		
			Sample Name	OL-F-5A-20-CCP-03		OL-F-5A-20-PKSD-06		OL-F-5B-20-WALL-01		OL-F-5B-20-PKSD-01		OL-F-5B-20-SMB-02		
			Sampled	7/7/2020		10/6/2020		5/20/2020		5/27/2020		7/2/2020		
			Lab Sample ID	410-7904-1		410-19110-2		410-3728-9		410-3728-18		410-6755-3		
			Taxonomic	CCP		PKSD		WALL		PKSD		SMB		
			Age (yrs)	4+		3+		7		4+		10+		
			Gender	M		F		M		M		F		
			Length (mm)	416		181		580		190		476		
			Weight (g)	1068		141		1916		155		1289		
Method	Parameter Code	Parameter Name	Units											
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ		75.2		NRQ		75.9		NRQ		
SW3540M	LIPIDS	%Lipids Determination	%	NRQ		2		NRQ		1.5		NRQ		
SW7471	7439-97-6	Mercury	mg/kg	NRQ		0.088	J	NRQ		0.2		NRQ		
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ		160	U	NRQ		31	U	NRQ		
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ		33	U	NRQ		34	UJ	NRQ		
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ		33	U	NRQ		34	UJ	NRQ		
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ		33	U	NRQ		34	UJ	NRQ		
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ		33	U	NRQ		34	UJ	NRQ		
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ		33	U	NRQ		34	UJ	NRQ		
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ		45		NRQ		110	J-	NRQ		
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ		25	J	NRQ		34	UJ	NRQ		
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ		21	J	NRQ		34	UJ	NRQ		
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ		33	U	NRQ		34	UJ	NRQ		
Calculated	PCB	Total PCBs	ug/kg	NRQ		91		NRQ		110	J-	NRQ		
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	NRQ		0.68	J	NRQ		0.22	J	NRQ		
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	NRQ		0.025	U	NRQ		0.083	U	NRQ		
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	NRQ		0.033	U	NRQ		0.12	U	NRQ		
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	NRQ		0.011	U	NRQ		0.073	J	NRQ		
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	NRQ		0.12	J	NRQ		4.1	J	NRQ		
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	NRQ		0.011	U	NRQ		0.0085	U	NRQ		
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	NRQ		0.33	J	NRQ		0.049	U	NRQ		
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	NRQ		0.011	U	NRQ		0.0094	U	NRQ		
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	NRQ		0.017	U	NRQ		0.061	U	NRQ		
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	NRQ		0.051	U	NRQ		0.09	U	NRQ		
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	NRQ		0.027	U	NRQ		0.1	U	NRQ		
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	NRQ		0.016	U	NRQ		0.044	U	NRQ		
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	NRQ		0.022	U	NRQ		2	J	NRQ		
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	NRQ		0.0038	U	NRQ		0.0092	U	NRQ		
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	NRQ		0.18	J	NRQ		0.11	U	NRQ		
SW8290	3268-87-9	OCDD	NG/KG	NRQ		4.6	J	NRQ		0.54	J	NRQ		
SW8290	39001-02-0	OCDF	NG/KG	NRQ		0.12	J	NRQ		0.0053	U	NRQ		

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-5B		OL-F-5B		OL-F-6A		OL-F-6A		OL-F-7A	
			Field Sample ID	OL-3228-04F		OL-3230-05F		OL-3220-07F		OL-3225-02F		OL-3226-08F	
			Sample Name	OL-F-5B-20-SMB-03		OL-F-5B-20-PKSD-03		OL-F-6A-20-PKSD-01		OL-F-6A-20-CCP-01		OL-F-7A-20-SMB-01	
			Sampled	7/2/2020		7/25/2020		5/19/2020		6/12/2020		6/30/2020	
			Lab Sample ID	410-6755-4		410-9225-5		410-3728-8		410-4529-2		410-6500-9	
			Taxonomic	SMB		PKSD		PKSD		CCP		SMB	
			Age (yrs)	8+		3+		4+		4+		5+	
			Gender	M		M		F		F		M	
			Length (mm)	470		195		183		682		456	
			Weight (g)	1582		159		141		4669		1432	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ		75.9		76.8		NRQ		74.3	
SW3540M	LIPIDS	%Lipids Determination	%	NRQ		0.84		1.4		NRQ		3.3	
SW7471	7439-97-6	Mercury	mg/kg	NRQ		0.21		0.18		NRQ		0.47	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ		15	U	31	U	NRQ		150	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ		33	U	33	U	NRQ		33	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ		33	U	33	U	NRQ		33	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ		33	U	33	U	NRQ		33	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ		33	U	33	U	NRQ		33	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ		33	U	33	U	NRQ		300	
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ		30	J	120		NRQ		280	
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ		27	J	33	U	NRQ		33	U
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ		33	U	33	U	NRQ		33	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ		33	U	33	U	NRQ		33	U
Calculated	PCB	Total PCBs	ug/kg	NRQ		57		120		NRQ		580	
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	NRQ		0.18	J	0.22	J	NRQ		0.3	J
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	NRQ		1.4	J	0.081	U	NRQ		0.12	U
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	NRQ		0.029	U	0.1	U	NRQ		0.14	U
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	NRQ		0.029	JB	0.012	UJ	NRQ		0.025	U
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	NRQ		0.019	U	6.8		NRQ		0.42	J
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	NRQ		0.083	J	0.012	U	NRQ		0.21	J
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	NRQ		1.8	J	0.069	U	NRQ		1.1	J
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	NRQ		0.062	J	0.013	U	NRQ		0.023	U
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	NRQ		0.08	JB	0.094	U	NRQ		0.022	U
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	NRQ		0.17	J	0.11	UJ	NRQ		2	J
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	NRQ		0.027	U	0.15	UJ	NRQ		0.067	U
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	NRQ		0.069	J	0.062	U	NRQ		0.1	J
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	NRQ		0.026	U	1.4	J	NRQ		0.61	J
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	NRQ		0.0035	U	0.014	U	NRQ		0.14	J
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	NRQ		0.11	J	0.14	UJ	NRQ		0.86	J
SW8290	3268-87-9	OCDD	NG/KG	NRQ		0.81	J	1.1	J	NRQ		1.1	J
SW8290	39001-02-0	OCDF	NG/KG	NRQ		0.19	J	0.072	J	NRQ		0.1	J

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-2A	OL-F-2A	OL-F-2A	OL-F-3A	OL-F-3A		OL-F-4A	OL-F-5A		
			Field Sample ID	OL-3222-13F	OL-3226-05F	OL-3226-06F	OL-3222-18F	OL-3233-01F		OL-3223-04F	OL-3220-13F		
			Sample Name	OL-F-2A-20-WALL-03	OL-F-2A-20-SMB-02	OL-F-2A-20-SMB-03	OL-F-3A-20-WALL-03	OL-F-3A-20-PKSD-01		OL-F-4A-20-CCP-03	OL-F-5A-20-SMB-01		
			Sampled	6/1/2020	6/29/2020	6/29/2020	6/3/2020	8/5/2020		6/4/2020	5/25/2020		
			Lab Sample ID	410-3939-30	410-6500-5	410-6500-6	410-3939-35	410-10902-1		410-3939-5	410-3728-14		
			Taxonomic	WALL	SMB	SMB	WALL	PKSD		CCP	SMB		
			Age (yrs)	5+	8	7+	4+	3+		3+	9+		
			Gender	F	F	M	F	M		M	F		
			Length (mm)	540	432	457	482	156		630	480		
			Weight (g)	2040	1389	1166	1525	87		3978	1688		
Method	Parameter Code	Parameter Name	Units										
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ	NRQ	NRQ	NRQ			NRQ	NRQ		
SW3540M	LIPIDS	%Lipids Determination	%	NRQ	NRQ	NRQ	NRQ	5.7		NRQ	NRQ		
SW7471	7439-97-6	Mercury	mg/kg	NRQ	NRQ	NRQ	NRQ	0.048	U	NRQ	NRQ		
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ	NRQ	NRQ	NRQ			NRQ	NRQ		
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ	NRQ	NRQ	NRQ	34	U	NRQ	NRQ		
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ	NRQ	NRQ	NRQ	34	U	NRQ	NRQ		
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ	NRQ	NRQ	NRQ	34	U	NRQ	NRQ		
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ	NRQ	NRQ	NRQ	34	U	NRQ	NRQ		
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ	NRQ	NRQ	NRQ	34	U	NRQ	NRQ		
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ	NRQ	NRQ	NRQ	44		NRQ	NRQ		
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ	NRQ	NRQ	NRQ	34	U	NRQ	NRQ		
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ	NRQ	NRQ	NRQ	34	U	NRQ	NRQ		
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ	NRQ	NRQ	NRQ	34	U	NRQ	NRQ		
Calculated	PCB	Total PCBs	ug/kg	NRQ	NRQ	NRQ	NRQ	44		NRQ	NRQ		
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	NRQ	NRQ	NRQ	NRQ	0.18	J	NRQ	NRQ		
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	1.3	J	NRQ	NRQ		
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	0.036	U	NRQ	NRQ		
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	NRQ	NRQ	NRQ	NRQ	0.036	JB	NRQ	NRQ		
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	0.015	U	NRQ	NRQ		
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	NRQ	NRQ	NRQ	NRQ	0.061	J	NRQ	NRQ		
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	0.32	J	NRQ	NRQ		
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	NRQ	NRQ	NRQ	NRQ	0.0051	U	NRQ	NRQ		
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	0.029	JB	NRQ	NRQ		
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	NRQ	NRQ	NRQ	NRQ	0.045	U	NRQ	NRQ		
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	0.19	J	NRQ	NRQ		
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	0.046	J	NRQ	NRQ		
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	0.057	J	NRQ	NRQ		
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	NRQ	NRQ	NRQ	NRQ	0.0084	U	NRQ	NRQ		
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	NRQ	NRQ	NRQ	NRQ	0.45	J	NRQ	NRQ		
SW8290	3268-87-9	OCDD	NG/KG	NRQ	NRQ	NRQ	NRQ	0.38	J	NRQ	NRQ		
SW8290	39001-02-0	OCDF	NG/KG	NRQ	NRQ	NRQ	NRQ	0.0061	U	NRQ	NRQ		

NRQ = Not reportable, poor quality due to incomplete homogenization.

				Location ID	OL-F-5A	OL-F-5A	OL-F-5A	OL-F-5A	OL-F-5A	OL-F-5A	OL-F-5B
				Field Sample ID	OL-3220-18F	OL-3220-19F	OL-3224-01F	OL-3224-04F	OL-3236-01F	OL-3238-01F	OL-3222-05F
				Sample Name	OL-F-5A-20-WALL-02	OL-F-5A-20-WALL-03	OL-F-5A-20-PKSD-01	OL-F-5A-20-PKSD-04	OL-F-5A-20-CCP-04	OL-F-5A-20-PKSD-05	OL-F-5B-20-CCP-02
				Sampled	5/27/2020	5/27/2020	6/9/2020	6/9/2020	7/22/2020	10/6/2020	5/29/2020
				Lab Sample ID	410-3728-19	410-3728-20	410-4044-1	410-4044-4	410-16346-1	410-19110-1	410-3939-21
				Taxonomic	WALL	WALL	PKSD	PKSD	CCP	PKSD	CCP
				Age (yrs)	4+	8+	2+	4+	4+	4	3+
				Gender	F	M	M	F	M	M	M
				Length (mm)	555	510	160	176	702	162	445
				Weight (g)	2332	1706	89	120	4598	118	1411
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ	NRQ			76.7	NRQ	73.8	NRQ
SW3540M	LIPIDS	%Lipids Determination	%	NRQ	NRQ	2.4		1.7	NRQ	1.8	NRQ
SW7471	7439-97-6	Mercury	mg/kg	NRQ	NRQ	0.19		0.048 U	NRQ	0.05 U	NRQ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ	NRQ			3.1 U	NRQ	15 U	NRQ
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ	NRQ	33	U	34 U	NRQ	34 U	NRQ
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ	NRQ	33	U	34 U	NRQ	34 U	NRQ
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ	NRQ	33	U	34 U	NRQ	34 U	NRQ
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ	NRQ	33	U	34 U	NRQ	34 U	NRQ
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ	NRQ	33	U	34 U	NRQ	34 U	NRQ
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ	NRQ	25	J	28 J	NRQ	8.5 J	NRQ
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ	NRQ	33	U	34 U	NRQ	34 U	NRQ
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ	NRQ	33	U	34 U	NRQ	34 U	NRQ
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ	NRQ	33	U	34 U	NRQ	34 U	NRQ
Calculated	PCB	Total PCBs	ug/kg	NRQ	NRQ	25	J	28 J	NRQ	8.5 J	NRQ
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	NRQ	NRQ	0.29	J	0.17 J	NRQ	0.92 J	NRQ
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	NRQ	NRQ	1.5	J	1.6 J	NRQ	0.024 U	NRQ
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	NRQ	NRQ	0.051	U	0.054 U	NRQ	0.032 U	NRQ
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	NRQ	NRQ	0.03	JB	0.012 U	NRQ	0.045 JB	NRQ
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	NRQ	NRQ	0.013	U	0.019 JB	NRQ	0.04 U	NRQ
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	NRQ	NRQ	0.05	J	0.012 U	NRQ	0.12 J	NRQ
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	NRQ	NRQ	0.013	U	0.34 J	NRQ	1.1 J	NRQ
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	NRQ	NRQ	0.012	U	0.012 U	NRQ	0.17 J	NRQ
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	NRQ	NRQ	0.033	JB	0.015 U	NRQ	0.21 J	NRQ
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	NRQ	NRQ	0.067	J	0.21 J	NRQ	0.029 U	NRQ
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	NRQ	NRQ	0.15	J	0.17 J	NRQ	0.15 J	NRQ
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	NRQ	NRQ	0.023	J	0.031 J	NRQ	0.096 J	NRQ
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	NRQ	NRQ	0.78	J	0.018 U	NRQ	0.12 J	NRQ
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	NRQ	NRQ	0.019	U	0.033 J	NRQ	0.047 J	NRQ
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	NRQ	NRQ	0.054	J	0.21 J	NRQ	0.32 J	NRQ
SW8290	3268-87-9	OCDD	NG/KG	NRQ	NRQ	0.59	J	0.34 J	NRQ	1.8 J	NRQ
SW8290	39001-02-0	OCDF	NG/KG	NRQ	NRQ	0.031	JB	0.05 JB	NRQ	0.2 J	NRQ

NRQ = Not reportable, poor quality due to incomplete homoger

			Location ID	OL-F-5B		OL-F-5B		OL-F-6A		OL-F-6A		OL-F-7A		OL-F-7A					
			Field Sample ID	OL-3222-06F		OL-3222-09F		OL-3225-04F		OL-3228-05F		OL-3223-10F		OL-3226-10F					
			Sample Name	OL-F-5B-20-CCP-03		OL-F-5B-20-WALL-03		OL-F-6A-20-CCP-03		OL-F-6A-20-SMB-01		OL-F-7A-20-PKSD-01		OL-F-7A-20-SMB-03					
			Sampled	5/29/2020		5/29/2020		6/12/2020		7/2/2020		6/5/2020		6/30/2020					
			Lab Sample ID	410-3939-22		410-3939-25		410-4529-4		410-6755-5		410-3939-11		410-6500-11					
			Taxonomic	CCP		WALL		CCP		SMB		PKSD		SMB					
			Age (yrs)	3+		5		2+		8		2+		5+					
			Gender	M		F		F		F		M		F					
			Length (mm)	445		521		600		464		167		405					
			Weight (g)	1329		1793		3704		1487		114		1094					
Method	Parameter Code	Parameter Name	Units																
ASTM D2216	MOISTURE-%	Percent Moisture	%	78		NRQ		NRQ		74		76.4		NRQ					
SW3540M	LIPIDS	%Lipids Determination	%	1.6		NRQ		NRQ		7.6		1.7		NRQ					
SW7471	7439-97-6	Mercury	mg/kg	0.048	U	NRQ		NRQ		0.42		0.15		NRQ					
SW8081	118-74-1	Hexachlorobenzene	ug/kg	1.4	J	NRQ		NRQ		15	U	2.2	J	NRQ					
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	NRQ		NRQ		66	U	33	U	NRQ					
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	NRQ		NRQ		66	U	33	U	NRQ					
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	NRQ		NRQ		66	U	33	U	NRQ					
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	NRQ		NRQ		66	U	33	U	NRQ					
SW8082	12672-29-6	Aroclor-1248	ug/kg	94		NRQ		NRQ		350		33	U	NRQ					
SW8082	11097-69-1	Aroclor-1254	ug/kg	51		NRQ		NRQ		340		55		NRQ					
SW8082	11096-82-5	Aroclor-1260	ug/kg	34	U	NRQ		NRQ		230	J	70		NRQ					
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	NRQ		NRQ		66	U	33	U	NRQ					
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	NRQ		NRQ		66	U	33	U	NRQ					
Calculated	PCB	Total PCBs	ug/kg	150		NRQ		NRQ		920		130		NRQ					
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	0.84	J	NRQ		NRQ		0.27	J	0.56	J	NRQ					
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	0.6	J	NRQ		NRQ		15	J	2.1	J	NRQ					
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	0.19	J	NRQ		NRQ		0.17	U	0.069	U	NRQ					
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	0.13	J	NRQ		NRQ		0.035	U	0.014	U	NRQ					
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	0.07	J	NRQ		NRQ		0.035	U	0.013	U	NRQ					
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	0.21	J	NRQ		NRQ		0.2	J	0.061	J	NRQ					
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	0.25	J	NRQ		NRQ		4.2	J	0.6	J	NRQ					
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	0.13	J	NRQ		NRQ		0.037	U	0.027	JB	NRQ					
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	0.12	JB	NRQ		NRQ		0.05	JB	0.014	U	NRQ					
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	0.2	J	NRQ		NRQ		2.2	J	0.084	U	NRQ					
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	0.24	J	NRQ		NRQ		0.85	J	0.14	J	NRQ					
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	0.093	J	NRQ		NRQ		0.17	J	0.027	J	NRQ					
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	0.26	J	NRQ		NRQ		0.86	J	0.12	J	NRQ					
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	0.037	U	NRQ		NRQ		0.026	U	0.039	U	NRQ					
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	0.099	J	NRQ		NRQ		1	J	0.12	J	NRQ					
SW8290	3268-87-9	OCDD	NG/KG	6.6	J	NRQ		NRQ		1	J	0.92	J	NRQ					
SW8290	39001-02-0	OCDF	NG/KG	0.13	J	NRQ		NRQ		0.0063	U	0.04	JB	NRQ					

NRQ = Not reportable, poor quality due to incomplete homogen

			Location ID	OL-F-1A		OL-F-2A		OL-F-3A		OL-F-3A		OL-F-3A		OL-F-5A	
			Field Sample ID	OL-3223-12F		OL-3238-04F		OL-3226-07F		OL-3228-02F		OL-3238-05F		OL-3222-01F	
			Sample Name	OL-F-1A-20-CCP-01		OL-F-2A-20-PKSD-03		OL-F-3A-20-CCP-03		OL-F-3A-20-SMB-04		OL-F-3A-20-PKSD-03		OL-F-5A-20-SMB-02	
			Sampled	6/5/2020		10/9/2020		6/30/2020		7/1/2020		10/15/2020		5/27/2020	
			Lab Sample ID	410-3939-13		410-19110-4		410-6500-7		410-6755-2		410-19110-5		410-3939-17	
			Taxonomic	CCP		PKSD		CCP		SMB		PKSD		SMB	
			Age (yrs)	7+		3		4+		8+		3+		5	
			Gender	F		M		F		F		F		M	
			Length (mm)	618		158		635		456		155		430	
			Weight (g)	3154		84		3419		1515		82		983	
Method	Parameter Code	Parameter Name	Units												
ASTM D2216	MOISTURE-%	Percent Moisture	%	67.6				68.8		71.6				74.2	
SW3540M	LIPIDS	%Lipids Determination	%	1.8		5.7		10		4.4		2.4		3.5	
SW7471	7439-97-6	Mercury	mg/kg	0.25		0.066	J	0.13		0.95		0.065	J	0.66	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	15	UJ			31	UJ	15	UJ			31	UJ
SW8082	12674-11-2	Aroclor-1016	ug/kg	33	UJ	34	UJ	34	UJ	34	UJ	34	UJ	170	UJ
SW8082	11104-28-2	Aroclor-1221	ug/kg	33	UJ	34	UJ	34	UJ	34	UJ	34	UJ	170	UJ
SW8082	11141-16-5	Aroclor-1232	ug/kg	33	UJ	34	UJ	34	UJ	34	UJ	34	UJ	170	UJ
SW8082	53469-21-9	Aroclor-1242	ug/kg	33	UJ	34	UJ	34	UJ	34	UJ	34	UJ	170	UJ
SW8082	12672-29-6	Aroclor-1248	ug/kg	26	J	34	UJ	190	J-	260	J-	34	UJ	790	J-
SW8082	11097-69-1	Aroclor-1254	ug/kg	34	J-	74	J-	180	J-	420	J-	34	J-	740	J-
SW8082	11096-82-5	Aroclor-1260	ug/kg	49	J-	34	UJ	83	J-	300	J-	26	J	370	J-
SW8082	37324-23-5	Aroclor-1262	ug/kg	33	UJ	34	UJ	34	UJ	34	UJ	34	UJ	170	UJ
SW8082	11100-14-4	Aroclor-1268	ug/kg	20	J	60	J-	34	UJ	34	UJ	15	J	170	UJ
Calculated	PCB	Total PCBs	ug/kg	130	J-	130	J-	450	J-	980	J-	75	J-	1900	J-
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	1.2	J	1.7	J	1.8	J	3.4	J	0.86	J	4.7	J
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	3.4	J	0.026	UJ	3.2	J	0.28	U	1	J	0.17	UJ
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	0.11	U	0.036	U	0.14	U	0.4	U	0.028	U	0.22	U
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	0.059	J	0.017	UJ	0.25	J	0.074	U	0.0024	U	0.34	J
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	0.043	U	0.018	UJ	0.29	J	0.068	U	0.048	JB	0.036	UJ
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	0.18	J	0.13	J	0.91	J	0.23	J	0.074	J	0.75	J
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	0.041	U	0.017	UJ	0.26	J	0.065	U	0.011	U	0.035	UJ
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	0.015	U	0.017	UJ	0.056	U	0.076	U	0.025	JB	0.25	J
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	0.06	U	0.019	UJ	0.052	U	0.081	U	0.012	U	0.036	U
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	0.13	U	0.073	UJ	0.78	J	0.68	U	0.043	U	0.22	UJ
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	0.075	U	0.025	UJ	0.11	U	0.29	U	0.015	U	0.91	J
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	0.041	U	0.018	UJ	0.23	J	0.066	U	0.044	JB	0.034	U
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	2.8	J	0.018	UJ	4.4	J	5.6		0.011	U	1.2	J
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	0.06	J	0.012	UJ	0.05	U	0.093	U	0.0078	U	0.59	J
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	0.043	U	0.2	J	2.8		1.7		0.46	J	1.7	J-
SW8290	3268-87-9	OCDD	NG/KG	10	J+	22	J+	5.3	J	29	J+	9.2	J	51	J+
SW8290	39001-02-0	OCDF	NG/KG	0.088	U	1.2	J	0.039	U	1.2	J	0.5	J	2.5	J

			Location ID	OL-F-7A		OL-F-7A	
			Field Sample ID	OL-3220-14F		OL-3220-16F	
			Sample Name	OL-F-7A-20-WALL-01		OL-F-7A-20-WALL-03	
			Sampled	5/26/2020		5/26/2020	
			Lab Sample ID	410-3728-15		410-3728-17	
			Taxonomic	WALL		WALL	
			Age (yrs)	4+		6+	
			Gender	F		F	
			Length (mm)	515		550	
			Weight (g)	1610		2210	
Method	Parameter Code	Parameter Name	Units				
ASTM D2216	MOISTURE-%	Percent Moisture	%	73.4		72.4	
SW3540M	LIPIDS	%Lipids Determination	%	7.8		5	
SW7471	7439-97-6	Mercury	mg/kg	0.64		0.82	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	15	UJ	31	UJ
SW8082	12674-11-2	Aroclor-1016	ug/kg	170	UJ	33	UJ
SW8082	11104-28-2	Aroclor-1221	ug/kg	170	UJ	33	UJ
SW8082	11141-16-5	Aroclor-1232	ug/kg	170	UJ	33	UJ
SW8082	53469-21-9	Aroclor-1242	ug/kg	170	UJ	33	UJ
SW8082	12672-29-6	Aroclor-1248	ug/kg	420	J-	330	J-
SW8082	11097-69-1	Aroclor-1254	ug/kg	330	J-	310	J-
SW8082	11096-82-5	Aroclor-1260	ug/kg	190	J-	270	J-
SW8082	37324-23-5	Aroclor-1262	ug/kg	170	UJ	33	UJ
SW8082	11100-14-4	Aroclor-1268	ug/kg	170	UJ	33	UJ
Calculated	PCB	Total PCBs	ug/kg	940	J-	910	J-
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	0.34	J	0.38	J
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	8	J	0.11	U
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	0.14	U	0.14	U
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	0.024	U	0.04	U
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	0.11	J	0.045	U
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	0.025	U	0.16	J
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	0.18	J	1.4	J
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	0.025	U	0.044	U
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	0.096	J	0.049	U
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	0.36	J	0.35	UJ
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	0.51	J	0.13	UJ
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	0.035	U	0.045	UJ
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	0.079	U	0.24	J
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	0.081	U	0.098	UJ
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	1.5		1.3	
SW8290	3268-87-9	OCDD	NG/KG	0.67	J	0.95	J
SW8290	39001-02-0	OCDF	NG/KG	0.24	J	0.14	JB

			Location ID	OL-F-1A		OL-F-2A		OL-F-2A		OL-F-2A		OL-F-2A	
			Field Sample ID	OL-3229-04F		OL-3222-12F		OL-3229-06F		OL-3236-02F		OL-3238-03F	
			Sample Name	OL-F-1A-20-SMB-03		OL-F-2A-20-WALL-02		OL-F-2A-20-CCP-03		OL-F-2A-20-PKSD-01		OL-F-2A-20-PKSD-02	
			Sampled	7/14/2020		6/1/2020		7/15/2020		8/20/2020		10/9/2020	
			Lab Sample ID	410-7904-4		410-3939-29		410-7904-6		410-16346-2		410-19110-3	
			Taxonomic	SMB		WALL		CCP		PKSD		PKSD	
			Age (yrs)	8+		4+		2+		3+		2+	
			Gender	M		F		F		F		F	
			Length (mm)	469		530		446		146		152	
			Weight (g)	1318		1679		1343		73		77	
Method	Parameter Code	Parameter Name	Units										
ASTM D2216	MOISTURE-%	Percent Moisture	%	78.1		79.4		72.4					
SW3540M	LIPIDS	%Lipids Determination	%	2.6		3.4		9.5		NRQ		NRQ	
SW7471	7439-97-6	Mercury	mg/kg	0.53		0.47		0.05	U	NRQ		NRQ	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	15	U	3.1	U	2.4	J				
SW8082	12674-11-2	Aroclor-1016	ug/kg	170	U	33	U	34	U	NRQ		NRQ	
SW8082	11104-28-2	Aroclor-1221	ug/kg	170	U	33	U	34	U	NRQ		NRQ	
SW8082	11141-16-5	Aroclor-1232	ug/kg	170	U	33	U	34	U	NRQ		NRQ	
SW8082	53469-21-9	Aroclor-1242	ug/kg	170	U	33	U	34	U	NRQ		NRQ	
SW8082	12672-29-6	Aroclor-1248	ug/kg	170	U	92		99		NRQ		NRQ	
SW8082	11097-69-1	Aroclor-1254	ug/kg	350		86		71		NRQ		NRQ	
SW8082	11096-82-5	Aroclor-1260	ug/kg	370		91		66		NRQ		NRQ	
SW8082	37324-23-5	Aroclor-1262	ug/kg	170	U	33	U	34	U	NRQ		NRQ	
SW8082	11100-14-4	Aroclor-1268	ug/kg	170	U	33	U	34	U	NRQ		NRQ	
Calculated	PCB	Total PCBs	ug/kg	720		270		240		NRQ		NRQ	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-3A		OL-F-4A		OL-F-4A		OL-F-4A		OL-F-5A	
			Field Sample ID	OL-3228-01F		OL-3222-19F		OL-3223-07F		OL-3230-01F		OL-3223-08F	
			Sample Name	OL-F-3A-20-SMB-03		OL-F-4A-20-CCP-01		OL-F-4A-20-WALL-03		OL-F-4A-20-PKSD-01		OL-F-5A-20-SMB-03	
			Sampled	7/1/2020		6/3/2020		6/4/2020		7/17/2020		6/4/2020	
			Lab Sample ID	410-6755-1		410-3939-36		410-3939-8		410-9225-1		410-3939-9	
			Taxonomic	SMB		CCP		WALL		PKSD		SMB	
			Age (yrs)	4+		3+		8+		2+		7	
			Gender	F		F		M		F		F	
			Length (mm)	415		518		490		143		460	
			Weight (g)	1239		1956		1645		80		1426	
Method	Parameter Code	Parameter Name	Units										
ASTM D2216	MOISTURE-%	Percent Moisture	%	75.8		74.8		NRQ				77.2	
SW3540M	LIPIDS	%Lipids Determination	%	4.4		7.2		NRQ		NRQ		2.4	
SW7471	7439-97-6	Mercury	mg/kg	0.25		0.05	U	NRQ		NRQ		0.41	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	15	U	3	U	NRQ		NRQ		15	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	33	U	34	U	NRQ		NRQ		33	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	33	U	34	U	NRQ		NRQ		33	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	33	U	34	U	NRQ		NRQ		33	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	33	U	34	U	NRQ		NRQ		33	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	150		76		NRQ		NRQ		110	
SW8082	11097-69-1	Aroclor-1254	ug/kg	170		73		NRQ		NRQ		120	
SW8082	11096-82-5	Aroclor-1260	ug/kg	200	J	69		NRQ		NRQ		120	
SW8082	37324-23-5	Aroclor-1262	ug/kg	33	U	34	U	NRQ		NRQ		33	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	33	U	34	U	NRQ		NRQ		33	U
Calculated	PCB	Total PCBs	ug/kg	520		220		NRQ		NRQ		350	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-7A	OL-F-7A
			Field Sample ID	OL-3220-15F	OL-3230-04F
			Sample Name	OL-F-7A-20-WALL-02	OL-F-7A-20-CCP-01
			Sampled	5/26/2020	7/17/2020
			Lab Sample ID	410-3728-16	410-9225-4
			Taxonomic	WALL	CCP
			Age (yrs)	5+	6
			Gender	M	F
			Length (mm)	549	640
			Weight (g)	2194	3815
Method	Parameter Code	Parameter Name	Units		
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ	NRQ
SW3540M	LIPIDS	%Lipids Determination	%	NRQ	NRQ
SW7471	7439-97-6	Mercury	mg/kg	NRQ	NRQ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ	NRQ
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ	NRQ
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ	NRQ
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ	NRQ
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ	NRQ
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ	NRQ
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ	NRQ
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ	NRQ
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ	NRQ
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ	NRQ
Calculated	PCB	Total PCBs	ug/kg	NRQ	NRQ

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-1A				OL-F-1A				OL-F-1A				OL-F-1A				OL-F-1A	
			Field Sample ID	OL-3220-01F				OL-3220-02F				OL-3220-03F				OL-3220-10F				OL-3220-12F	
			Sample Name	OL-F-1A-20-PKSD-01				OL-F-1A-20-PKSD-02				OL-F-1A-20-PKSD-03				OL-F-1A-20-WALL-01				OL-F-1A-20-WALL-03	
			Sampled	3/17/2020				3/19/2020				3/19/2020				5/21/2020				5/21/2020	
			Lab Sample ID	410-3728-1				410-3728-2				410-3728-3				410-3728-11				410-3728-13	
			Taxonomic	PKSD				PKSD				PKSD				WALL				WALL	
			Age (yrs)	2+				3+				2+				5+				3+	
			Gender	M				M				F				F				F	
			Length (mm)	132				129				129				521				553	
			Weight (g)	46				42				41				1871				1751	
Method	Parameter Code	Parameter Name	Units																		
ASTM D2216	MOISTURE-%	Percent Moisture	%													75.5				NRQ	
SW3540M	LIPIDS	%Lipids Determination	%													4.3				NRQ	
SW7471	7439-97-6	Mercury	mg/kg	NRQ				NRQ				0.068	J			0.28				NRQ	
SW8081	118-74-1	Hexachlorobenzene	ug/kg													31	U			NRQ	
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ				NRQ				33	U			34	U			NRQ	
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ				NRQ				33	U			34	U			NRQ	
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ				NRQ				33	U			34	U			NRQ	
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ				NRQ				33	U			34	U			NRQ	
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ				NRQ				33	U			34	U			NRQ	
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ				NRQ				40				190				NRQ	
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ				NRQ				33	U			34	U			NRQ	
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ				NRQ				33	U			34	U			NRQ	
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ				NRQ				33	U			34	U			NRQ	
Calculated	PCB	Total PCBs	ug/kg	NRQ				NRQ				40				190				NRQ	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-2A	OL-F-3A	OL-F-3A	OL-F-3A		OL-F-4A	
			Field Sample ID	OL-3222-11F	OL-3222-16F	OL-3222-17F	OL-3236-04F		OL-3230-02F	
			Sample Name	OL-F-2A-20-WALL-01	OL-F-3A-20-WALL-01	OL-F-3A-20-WALL-02	OL-F-3A-20-PKSD-02		OL-F-4A-20-PKSD-02	
			Sampled	6/1/2020	6/3/2020	6/3/2020	10/2/2020		7/17/2020	
			Lab Sample ID	410-3939-27	410-3939-33	410-3939-34	410-16346-4		410-9225-2	
			Taxonomic	WALL	WALL	WALL	PKSD		PKSD	
			Age (yrs)	7	5+	5+	2+		3+	
			Gender	M	F	F	F		M	
			Length (mm)	505	550	535	129		135	
			Weight (g)	1566	2277	2061	36		55	
Method	Parameter Code	Parameter Name	Units							
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ	NRQ	NRQ				
SW3540M	LIPIDS	%Lipids Determination	%	NRQ	NRQ	NRQ			NRQ	
SW7471	7439-97-6	Mercury	mg/kg	NRQ	NRQ	NRQ	0.05	J	NRQ	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ	NRQ	NRQ				
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ	NRQ	NRQ	34	U	NRQ	
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ	NRQ	NRQ	34	U	NRQ	
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ	NRQ	NRQ	34	U	NRQ	
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ	NRQ	NRQ	34	U	NRQ	
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ	NRQ	NRQ	34	U	NRQ	
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ	NRQ	NRQ	19	J	NRQ	
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ	NRQ	NRQ	34	U	NRQ	
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ	NRQ	NRQ	34	U	NRQ	
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ	NRQ	NRQ	34	U	NRQ	
Calculated	PCB	Total PCBs	ug/kg	NRQ	NRQ	NRQ	19	J	NRQ	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-4A		OL-F-5A	OL-F-5A	OL-F-5A		OL-F-5B	
			Field Sample ID	OL-3230-03F		OL-3220-06F	OL-3220-20F	OL-3224-03F		OL-3222-08F	
			Sample Name	OL-F-4A-20-PKSD-03		OL-F-5A-20-WALL-01	OL-F-5A-20-WALL-04	OL-F-5A-20-PKSD-03		OL-F-5B-20-WALL-02	
			Sampled	7/17/2020		5/18/2020	5/27/2020	6/9/2020		5/29/2020	
			Lab Sample ID	410-9225-3		410-3728-7	410-3728-21	410-4044-3		410-3939-24	
			Taxonomic	PKSD		WALL	WALL	PKSD		WALL	
			Age (yrs)	4+		3+	6+	2+		6+	
			Gender	M		F	F	F		M	
			Length (mm)	132		502	548	142		510	
			Weight (g)	58		1481	2054	69		1623	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%			NRQ	NRQ			NRQ	
SW3540M	LIPIDS	%Lipids Determination	%	1.6		NRQ	NRQ	1.7		NRQ	
SW7471	7439-97-6	Mercury	mg/kg	0.061	J	NRQ	NRQ	0.14		NRQ	
SW8081	118-74-1	Hexachlorobenzene	ug/kg			NRQ	NRQ			NRQ	
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	NRQ	NRQ	34	U	NRQ	
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	NRQ	NRQ	34	U	NRQ	
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	NRQ	NRQ	34	U	NRQ	
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	NRQ	NRQ	34	U	NRQ	
SW8082	12672-29-6	Aroclor-1248	ug/kg	34	U	NRQ	NRQ	34	U	NRQ	
SW8082	11097-69-1	Aroclor-1254	ug/kg	30	J	NRQ	NRQ	28	J	NRQ	
SW8082	11096-82-5	Aroclor-1260	ug/kg	34	U	NRQ	NRQ	34	U	NRQ	
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	NRQ	NRQ	34	U	NRQ	
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	NRQ	NRQ	34	U	NRQ	
Calculated	PCB	Total PCBs	ug/kg	30	J	NRQ	NRQ	28	J	NRQ	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-5B		OL-F-6A	OL-F-6A	OL-F-7A		OL-F-7A	
			Field Sample ID	OL-3223-11F		OL-3220-09F	OL-3223-15F	OL-3229-02F		OL-3229-03F	
			Sample Name	OL-F-5B-20-PKSD-02		OL-F-6A-20-WALL-01	OL-F-6A-20-WALL-02	OL-F-7A-20-PKSD-02		OL-F-7A-20-PKSD-03	
			Sampled	6/5/2020		5/21/2020	6/5/2020	7/9/2020		7/9/2020	
			Lab Sample ID	410-3939-12		410-3728-10	410-3939-16	410-7904-2		410-7904-3	
			Taxonomic	PKSD		WALL	WALL	PKSD		PKSD	
			Age (yrs)	2+		6+	4+	2+		3+	
			Gender	M		F	F	F		M	
			Length (mm)	145		546	573	127		138	
			Weight (g)	70		2097	2345	46		56	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%			NRQ	NRQ				
SW3540M	LIPIDS	%Lipids Determination	%	1.6		NRQ	NRQ			2.7	
SW7471	7439-97-6	Mercury	mg/kg	0.084	J	NRQ	NRQ	0.057	J	0.05	J
SW8081	118-74-1	Hexachlorobenzene	ug/kg			NRQ	NRQ				
SW8082	12674-11-2	Aroclor-1016	ug/kg	34	U	NRQ	NRQ	34	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	34	U	NRQ	NRQ	34	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	34	U	NRQ	NRQ	34	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	34	U	NRQ	NRQ	34	U	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	34	U	NRQ	NRQ	34	U	34	U
SW8082	11097-69-1	Aroclor-1254	ug/kg	39	J	NRQ	NRQ	23	J	36	
SW8082	11096-82-5	Aroclor-1260	ug/kg	34	U	NRQ	NRQ	34	U	34	U
SW8082	37324-23-5	Aroclor-1262	ug/kg	34	U	NRQ	NRQ	34	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	34	U	NRQ	NRQ	34	U	34	U
Calculated	PCB	Total PCBs	ug/kg	39		NRQ	NRQ	23	J	36	

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-1A		OL-F-1A		OL-F-1A		OL-F-2A	
			Field Sample ID	OL-3223-13F		OL-3223-14F		OL-3225-01F		OL-3222-10F	
			Sample Name	OL-F-1A-20-SMB-01		OL-F-1A-20-SMB-02		OL-F-1A-20-CCP-02		OL-F-2A-20-SMB-01	
			Sampled	6/5/2020		6/5/2020		6/11/2020		6/1/2020	
			Lab Sample ID	410-3939-14		410-3939-15		410-4529-1		410-3939-26	
			Taxonomic	SMB		SMB		CCP		SMB	
			Age (yrs)	5+		3+		6+		4+	
			Gender	M		F		F		F	
			Length (mm)	415		395		655		400	
			Weight (g)	1053		1026		4006		831	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ		NRQ		74		78	
SW3540M	LIPIDS	%Lipids Determination	%	NRQ		NRQ		0.5		2.2	
SW7471	7439-97-6	Mercury	mg/kg	NRQ		NRQ		0.047	U	0.22	
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ		NRQ		12	J	11	J
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ		NRQ		33	U	34	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ		NRQ		33	U	34	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ		NRQ		33	U	34	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ		NRQ		33	U	34	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ		NRQ		33	U	34	U
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ		NRQ		180		23	J
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ		NRQ		310		34	U
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ		NRQ		33	U	34	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ		NRQ		33	U	34	U
Calculated	PCB	Total PCBs	ug/kg	NRQ		NRQ		490		23	J

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-3A	OL-F-3A	OL-F-3A		OL-F-4A	OL-F-4A
			Field Sample ID	OL-3222-14F	OL-3226-01F	OL-3226-02F		OL-3222-03F	OL-3223-03F
			Sample Name	OL-F-3A-20-CCP-01	OL-F-3A-20-CCP-02	OL-F-3A-20-SMB-02		OL-F-4A-20-SMB-01	OL-F-4A-20-CCP-02
			Sampled	6/3/2020	6/15/2020	6/26/2020		5/28/2020	6/4/2020
			Lab Sample ID	410-3939-31	410-6500-1	410-6500-2		410-3939-19	410-3939-4
			Taxonomic	CCP	CCP	SMB		SMB	CCP
			Age (yrs)	3+	6	8+		10+	4
			Gender	M	F	F		M	F
			Length (mm)	565	670	456		466	556
			Weight (g)	2432	4290	1556		1364	3121
Method	Parameter Code	Parameter Name	Units						
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ	NRQ	74.6		NRQ	NRQ
SW3540M	LIPIDS	%Lipids Determination	%	NRQ	NRQ	2.6		NRQ	NRQ
SW7471	7439-97-6	Mercury	mg/kg	NRQ	NRQ	0.6		NRQ	NRQ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ	NRQ	29		NRQ	NRQ
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ	NRQ	33	U	NRQ	NRQ
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ	NRQ	33	U	NRQ	NRQ
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ	NRQ	33	U	NRQ	NRQ
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ	NRQ	33	U	NRQ	NRQ
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ	NRQ	33	U	NRQ	NRQ
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ	NRQ	130		NRQ	NRQ
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ	NRQ	33	U	NRQ	NRQ
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ	NRQ	33	U	NRQ	NRQ
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ	NRQ	33	U	NRQ	NRQ
Calculated	PCB	Total PCBs	ug/kg	NRQ	NRQ	130		NRQ	NRQ

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-4A	OL-F-5A	OL-F-5A	OL-F-5B	OL-F-5B
			Field Sample ID	OL-3223-06F	OL-3220-04F	OL-3223-09F	OL-3222-04F	OL-3222-07F
			Sample Name	OL-F-4A-20-SMB-03	OL-F-5A-20-CCP-01	OL-F-5A-20-SMB-04	OL-F-5B-20-CCP-01	OL-F-5B-20-SMB-01
			Sampled	6/4/2020	5/18/2020	6/4/2020	5/29/2020	5/29/2020
			Lab Sample ID	410-3939-7	410-3728-4	410-3939-10	410-3939-20	410-3939-23
			Taxonomic	SMB	CCP	SMB	CCP	SMB
			Age (yrs)	5+	4+	8+	4+	6+
			Gender	F	F	F	M	F
			Length (mm)	415	562	450	492	486
			Weight (g)	1115	5264	1014	1767	1547
Method	Parameter Code	Parameter Name	Units					
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ	NRQ	NRQ	NRQ	NRQ
SW3540M	LIPIDS	%Lipids Determination	%	NRQ	NRQ	NRQ	NRQ	NRQ
SW7471	7439-97-6	Mercury	mg/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ
Calculated	PCB	Total PCBs	ug/kg	NRQ	NRQ	NRQ	NRQ	NRQ

NRQ = Not reportable, poor quality due to incomplete homogenization.

			Location ID	OL-F-5B	OL-F-6A	OL-F-6A		OL-F-7A		OL-F-7A	
			Field Sample ID	OL-3223-02F	OL-3225-03F	OL-3228-06F		OL-3226-09F		OL-3236-03F	
			Sample Name	OL-F-5B-20-CCP-04	OL-F-6A-20-CCP-02	OL-F-6A-20-SMB-02		OL-F-7A-20-SMB-02		OL-F-7A-20-CCP-02	
			Sampled	6/3/2020	6/12/2020	7/2/2020		6/30/2020		10/1/2020	
			Lab Sample ID	410-3939-2	410-4529-3	410-6755-6		410-6500-10		410-16346-3	
			Taxonomic	CCP	CCP	SMB		SMB		CCP	
			Age (yrs)	3+	4+	6+		4+		2+	
			Gender	M	F	M		F		F	
			Length (mm)	400	602	440		415		400	
			Weight (g)	1015	3179	1169		1020		980	
Method	Parameter Code	Parameter Name	Units								
ASTM D2216	MOISTURE-%	Percent Moisture	%	NRQ	NRQ	75.5		73		80.6	
SW3540M	LIPIDS	%Lipids Determination	%	NRQ	NRQ	3		5.3		2	
SW7471	7439-97-6	Mercury	mg/kg	NRQ	NRQ	0.32		0.11		0.048	U
SW8081	118-74-1	Hexachlorobenzene	ug/kg	NRQ	NRQ	2.2	J	15	U	15	U
SW8082	12674-11-2	Aroclor-1016	ug/kg	NRQ	NRQ	170	U	33	U	33	U
SW8082	11104-28-2	Aroclor-1221	ug/kg	NRQ	NRQ	170	U	33	U	33	U
SW8082	11141-16-5	Aroclor-1232	ug/kg	NRQ	NRQ	170	U	33	U	33	U
SW8082	53469-21-9	Aroclor-1242	ug/kg	NRQ	NRQ	170	U	33	U	33	U
SW8082	12672-29-6	Aroclor-1248	ug/kg	NRQ	NRQ	290		94		33	U
SW8082	11097-69-1	Aroclor-1254	ug/kg	NRQ	NRQ	320		91		11	J
SW8082	11096-82-5	Aroclor-1260	ug/kg	NRQ	NRQ	200		51		33	U
SW8082	37324-23-5	Aroclor-1262	ug/kg	NRQ	NRQ	170	U	33	U	33	U
SW8082	11100-14-4	Aroclor-1268	ug/kg	NRQ	NRQ	170	U	33	U	33	U
Calculated	PCB	Total PCBs	ug/kg	NRQ	NRQ	810		240		11	J

NRQ = Not reportable, poor quality due to incomplete homogenization.

ATTACHMENT A-2 – VALIDATED LABORATORY DATA FOR ZOOPLANKTON SAMPLES

Onondaga Lake
2020 Biota Monitoring - Zooplankton samples

							Parameter	MERCURY		METHYL MERCURY	
							Method	E1631		E1630	
							Filtered	N		N	
							Units	mg/kg		ng/g	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type				
W1	OL-3502-01	6.6 - 6.6	05/12/2020	0E00054	TISSUE	REG	T-ZP			0.5	U
W1	OL-3510-01	6.6 - 6.6	06/16/2020	0F00083	TISSUE	REG	T-ZP	0.000174	U	0.8	U
W1	OL-3518-01	6.6 - 6.6	07/06/2020	0G00019	TISSUE	REG	T-ZP	0.0148		1	U
W1	OL-3525-01	6.6 - 6.6	07/21/2020	0G00072	TISSUE	REG	T-ZP	0.189		0.5	U
W1	OL-3532-01	6.6 - 6.6	08/04/2020	0H00022	TISSUE	REG	T-ZP	0.00615	J	0.5	UJ
W1	OL-3539-01	6.6 - 6.6	08/18/2020	0H00064	TISSUE	REG	T-ZP	0.0229		7	
W1	OL-3546-01	6.6 - 6.6	09/01/2020	0I00010	TISSUE	REG	T-ZP	0.0676		0.5	U
W1	OL-3551-01	6.6 - 6.6	09/09/2020	0I00032	TISSUE	REG	T-ZP	0.0414		0.01	
W1	OL-3555-01	6.6 - 6.6	09/15/2020	0I00051	TISSUE	REG	T-ZP	0.0146		1	U
W1	OL-3559-01	6.6 - 6.6	09/22/2020	0I00076	TISSUE	REG	T-ZP			0.9	J
W1	OL-3563-01	6.6 - 6.6	09/29/2020	0J00003	TISSUE	REG	T-ZP			2.2	U
W1	OL-3567-01	6.6 - 6.6	10/06/2020	0J00028	TISSUE	REG	T-ZP			6.2	
W1	OL-3571-01	6.6 - 6.6	10/13/2020	0J00072	TISSUE	REG	T-ZP			3.3	UJ
W1	OL-3575-01	6.6 - 6.6	10/20/2020	0J00104	TISSUE	REG	T-ZP			315	UJ
W1	OL-3579-01	6.6 - 6.6	10/27/2020	0J00138	TISSUE	REG	T-ZP			1.2	U
W1	OL-3583-01	6.6 - 6.6	11/04/2020	0K00026	TISSUE	REG	T-ZP			3	J
W1	OL-3587-01	6.6 - 6.6	11/18/2020	0K00094	TISSUE	REG	T-ZP			1	U

ATTACHMENT B – LCS SRM AND FIELD DUPLICATE RESULTS

Summary of LCS SRM Recoveries
Honeywell - 2020 Onondaga Lake Fish

SDG	Analytical Method	Analytical Parameter	LCS SRM %R	Lower LCS SRM QC Limit (%R)	Upper LCS SRM QC Limit (%R)
410-10894-1	SW7471	Mercury	96	80	120
410-10903-1	SW8082	Total PCBs	61	70	130
410-10903-1	SW8081	Hexachlorobenzene	40	70	130
410-10903-1	SW8081	4,4'-DDD	53	70	130
410-10903-1	SW8081	4,4'-DDT	78	70	130
410-10903-1	SW8081	4,4'-DDE	71	70	130
410-10903-1	SW7471	Mercury	103	80	120
410-3728-1	SW7471	Mercury	93	80	120
410-3728-2	SW7471	Mercury	93	80	120
410-3728-3	SW7471	Mercury	87	80	120
410-3728-4	SW7471	Mercury	91	80	120
410-3728-4	SW8290	2,3,7,8-TCDD	110	70	130
410-3728-4	SW8290	1,2,3,7,8,9-HxCDD	87	70	130
410-3728-4	SW8290	OCDD	127	70	130
410-3728-4	SW8290	1,2,3,4,6,7,8-HpCDD	122	70	130
410-3728-4	SW8290	1,2,3,4,7,8-HxCDD	296	70	130
410-3728-4	SW8290	1,2,3,7,8-PeCDD	99	70	130
410-3728-4	SW8290	2,3,7,8-Tcdf	181	70	130
410-3728-4	SW8290	1,2,3,7,8-PeCDF	120	70	130
410-3728-4	SW8290	1,2,3,6,7,8-HxCDD	107	70	130
410-3728-4	SW8290	2,3,7,8-TCDD	104	70	130
410-3728-4	SW8290	1,2,3,7,8,9-HxCDD	100	70	130
410-3728-4	SW8290	OCDD	199	70	130
410-3728-4	SW8290	1,2,3,4,6,7,8-HpCDD	124	70	130
410-3728-4	SW8290	1,2,3,4,7,8-HxCDD	103	70	130
410-3728-4	SW8290	1,2,3,7,8-PeCDD	248	70	130
410-3728-4	SW8290	2,3,7,8-Tcdf	100	70	130
410-3728-4	SW8290	1,2,3,7,8-PeCDF	140	70	130
410-3728-4	SW8290	1,2,3,6,7,8-HxCDD	129	70	130
410-3728-4	SW8290	2,3,7,8-TCDD	95	70	130
410-3728-4	SW8290	1,2,3,7,8,9-HxCDD	98	70	130
410-3728-4	SW8290	OCDD	140	70	130
410-3728-4	SW8290	1,2,3,4,6,7,8-HpCDD	113	70	130
410-3728-4	SW8290	1,2,3,4,7,8-HxCDD	111	70	130
410-3728-4	SW8290	1,2,3,7,8-PeCDD	278	70	130
410-3728-4	SW8290	2,3,7,8-Tcdf	98	70	130
410-3728-4	SW8290	1,2,3,7,8-PeCDF	119	70	130
410-3728-4	SW8290	1,2,3,6,7,8-HxCDD	146	70	130
410-3728-5	SW7471	Mercury	88	80	120
410-3728-5	SW8290	2,3,7,8-TCDD	117	70	130
410-3728-5	SW8290	1,2,3,7,8,9-HxCDD	100	70	130
410-3728-5	SW8290	OCDD	165	70	130
410-3728-5	SW8290	1,2,3,4,6,7,8-HpCDD	146	70	130
410-3728-5	SW8290	1,2,3,4,7,8-HxCDD	118	70	130

Summary of LCS SRM Recoveries
Honeywell - 2020 Onondaga Lake Fish

SDG	Analytical Method	Analytical Parameter	LCS SRM %R	Lower LCS SRM QC Limit (%R)	Upper LCS SRM QC Limit (%R)
410-3728-5	SW8290	1,2,3,7,8-PeCDD	288	70	130
410-3728-5	SW8290	2,3,7,8-Tcdf	109	70	130
410-3728-5	SW8290	1,2,3,7,8-PeCDF	151	70	130
410-3728-5	SW8290	1,2,3,6,7,8-HxCDD	136	70	130
410-3728-6	SW8081	Hexachlorobenzene	50	70	130
410-3728-6	SW8082	Total PCBs	39	70	130
410-3728-6	SW8290	2,3,7,8-TCDD	108	70	130
410-3728-6	SW8290	1,2,3,7,8,9-HxCDD	98	70	130
410-3728-6	SW8290	OCDD	136	70	130
410-3728-6	SW8290	1,2,3,4,6,7,8-HpCDD	123	70	130
410-3728-6	SW8290	1,2,3,4,7,8-HxCDD	289	70	130
410-3728-6	SW8290	1,2,3,7,8-PeCDD	96	70	130
410-3728-6	SW8290	2,3,7,8-Tcdf	102	70	130
410-3728-6	SW8290	1,2,3,7,8-PeCDF	133	70	130
410-3728-6	SW8290	1,2,3,6,7,8-HxCDD	111	70	130
410-3728-6	SW7471	Mercury	82	80	120
410-3728-6	SW3540M	%Lipids Determination	94	70	130
410-3728-7	SW7471	Mercury	90	80	120
410-3728-7	SW8081	Hexachlorobenzene	78	70	130
410-3728-7	SW8081	Hexachlorobenzene	91	70	130
410-3728-7	SW8081	Hexachlorobenzene	100	70	130
410-3728-7	SW8082	Total PCBs	83	70	130
410-3728-7	SW3540M	%Lipids Determination	123	70	130

NOTES:
SDG - Sample Delivery Group
LCS - Laboratory Control Sample
SRM - Standard Reference Material
%R - Percent Recovery

					2020_Sport-01					2020_Sport-04				
				Location ID	OL-F-1A		OL-F-1A			OL-F-2A		OL-F-2A		
				Field Sample ID	OL-3229-05F		OL-3229-05FDUP			OL-3222-11F		OL-3222-11DUP		
				Sample Name	OL-F-1A-20-CCP-03		OL-F-1A-20-CCP-03			OL-F-2A-20-WALL-01		OL-F-2A-20-WALL-01		
				Sampled	7/14/2020		7/14/2020			6/1/2020		6/1/2020		
				SDG	410-3728-4		410-3728-4			410-3728-2		410-3728-2		
				Lab Sample ID	410-7904-5		410-7904-7			410-3939-27		410-3939-28		
				Medium	Tissue		Tissue			Tissue		Tissue		
				Sample Type	REG		FD		Relative Percent Difference (RPD)	REG		FD		Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT			T-FT		T-FT		
Method	Parameter Code	Parameter Name	Units	Fraction										
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	31	U	30	U		30	U	31	U	
SW8081	72-54-8	4,4'-DDD	ug/kg	T										
SW8081	72-55-9	4,4'-DDE	ug/kg	T										
SW8081	50-29-3	4,4'-DDT	ug/kg	T										
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	640		600		6.45	33	U	34	U	
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	990	J	880		11.76	130		160		20.69
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	630		780		21.28	33	U	34	U	
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	170	U	170	U		33	U	34	U	
Calculated	PCB	Total PCBs	ug/kg	T	2300		2300		0.00	130		160		20.69
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T	1.9	J	2.1	J						
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T	0.12	U	0.19	U						
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T	0.14	U	0.21	U						
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T	0.4	J	0.4	J						
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T	0.71	J	0.72	J						
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T	2.6	J	2.5	J						
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T	4.6	J	2.2	J						
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T	0.49	J	0.42	J						
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T	0.051	U	0.03	U						
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T	6.3	J	6.1	J						
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T	0.17	U	0.15	U						
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T	0.65	J	0.66	J						
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T	5.7		5.5		3.57					
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T	0.23	J	0.03	U						
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T	1.5		1.5		0.00					
SW8290	3268-87-9	OCDD	NG/KG	T	2.2	J	2.4	J						
SW8290	39001-02-0	OCDF	NG/KG	T	0.1	J	0.17	J						

					2020_Prey-02					2020_Sport-03A				
				Location ID	OL-F-2A		OL-F-2A			OL-F-3A		OL-F-3A		
				Field Sample ID	OL-3234-04		OL-3234-04DUP			OL-3226-07F		OL-3226-07FDUP		
				Sample Name	OL-F-2A-20-RG-01		OL-F-2A-20-RG-01			OL-F-3A-20-CCP-03		OL-F-3A-20-CCP-03		
				Sampled	8/6/2020		8/6/2020			6/30/2020		6/30/2020		
				SDG	410-10894-1		410-10894-1			410-3728-6		410-3728-6		
				Lab Sample ID	410-10894-4		410-10894-21			410-6500-7		410-6500-8		
				Medium	Tissue		Tissue			Tissue		Tissue		
				Sample Type	REG		FD		Relative Percent Difference (RPD)	REG		FD		Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT			T-FT		T-FT		
Method	Parameter Code	Parameter Name	Units	Fraction										
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	1.7	U	1.6	U		31	UJ	31	UJ	
SW8081	72-54-8	4,4'-DDD	ug/kg	T	3.4	U	3.4	U						
SW8081	72-55-9	4,4'-DDE	ug/kg	T	3.4	UJ	1.9	J						
SW8081	50-29-3	4,4'-DDT	ug/kg	T	3.4	U	3.4	U						
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	49	J-	23	J	72.22	190	J-	210	J-	10.00
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	43		30	J	35.62	180	J-	190	J-	5.41
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	43		30	J	35.62	83	J-	90	J-	8.09
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
Calculated	PCB	Total PCBs	ug/kg	T	140	J-	83	J-	51.12	450	J-	490	J-	8.51
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T						1.8	J	2.3	JB	
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T						3.2	J	0.71	JB	
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T						0.14	U	0.17	JB	
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T						0.25	J	0.33	JB	
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T						0.29	J	0.44	JB	
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T						0.91	J	0.97	JB	
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T						0.26	J	0.53	JB	
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T						0.056	U	0.26	JB	
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T						0.052	U	0.088	JB	
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T						0.78	J	0.62	J	
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T						0.11	U	0.72	JB	
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T						0.23	J	0.24	JB	
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T						4.4	J	3.4	JB	
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T						0.05	U	0.019	U	
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T						2.8		3.1		10.17
SW8290	3268-87-9	OCDD	NG/KG	T						5.3	J	6.3	JB	
SW8290	39001-02-0	OCDF	NG/KG	T						0.039	U	0.26	JB	

					2020_Sport-02				2020_Sport-05				
				Location ID	OL-F-4A		OL-F-4A			OL-F-5A		OL-F-5A	
				Field Sample ID	OL-3223-04F		OL-3223-04FDUP			OL-3220-04F		OL-3220-04DUP	
				Sample Name	OL-F-4A-20-CCP-03		OL-F-4A-20-CCP-03			OL-F-5A-20-CCP-01		OL-F-5A-20-CCP-01	
				Sampled	6/4/2020		6/4/2020			5/18/2020		5/18/2020	
				SDG	410-3728-5		410-3728-5			410-3728-3		410-3728-3	
				Lab Sample ID	410-3939-5		410-3939-38			410-3728-4		410-3728-5	
				Medium	Tissue		Tissue			Tissue		Tissue	
				Sample Type	REG		FD		Relative Percent Difference (RPD)	REG		FD		Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT			T-FT		T-FT		
Method	Parameter Code	Parameter Name	Units	Fraction										
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	15	U	15	U		31	U	30	U	
SW8081	72-54-8	4,4'-DDD	ug/kg	T										
SW8081	72-55-9	4,4'-DDE	ug/kg	T										
SW8081	50-29-3	4,4'-DDT	ug/kg	T										
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	260		270		3.77	170	U	170	U	
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	200		230		13.95	700	J	790	J	12.08
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	140	J	34	U		170	U	170	U	
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	34	U	34	U		170	U	170	U	
Calculated	PCB	Total PCBs	ug/kg	T	600		500		18.18	700		790		12.08
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T	1.2	J	1.3	J						
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T	1.4	J	2.2	JB						
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T	0.035	U	0.065	U						
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T	0.13	J	0.17	JB						
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T	0.18	J	0.39	JB						
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T	0.49	J	0.54	JB						
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T	2	J	1.2	JB						
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T	0.18	J	0.21	JB						
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T	0.025	U	0.02	U						
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T	1	J	1.1	J						
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T	0.45	J	0.78	JB						
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T	0.22	J	0.2	J						
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T	0.64	J	0.93	JB						
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T	0.082	J	0.083	J						
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T	3.2		3.7		14.49					
SW8290	3268-87-9	OCDD	NG/KG	T	1.2	J	1.6	JB						
SW8290	39001-02-0	OCDF	NG/KG	T	0.064	JB	0.051	JB						

					2020_Prey-01				2020_Prey-03			
				Location ID	OL-F-5A		OL-F-5A		OL-F-6A		OL-F-6A	
				Field Sample ID	OL-3231-05		OL-3231-05DUP		OL-3237-05		OL-3237-05DUP	
				Sample Name	OL-F-5A-20-SHRH-01		OL-F-5A-20-SHRH-01		OL-F-6A-20-WHS-03		OL-F-6A-20-WHS-03	
				Sampled	7/27/2020		7/27/2020		9/8/2020		9/8/2020	
				SDG	410-3728-1		410-3728-1		410-10903-1		410-10903-1	
				Lab Sample ID	410-9221-5		410-9221-9		410-16344-5		410-16344-6	
				Medium	Tissue		Tissue		Tissue		Tissue	
				Sample Type	REG		FD	Relative Percent Difference (RPD)	REG		FD	Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT		T-FT		T-FT	
Method	Parameter Code	Parameter Name	Units	Fraction								
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	8.2	U	33	U		15	UJ	30	UJ	
SW8081	72-54-8	4,4'-DDD	ug/kg	T	8.1	J	68	U		18	UJ	36	UJ	
SW8081	72-55-9	4,4'-DDE	ug/kg	T	76		74		2.67	12	J	27	J	
SW8081	50-29-3	4,4'-DDT	ug/kg	T	17	UJ	68	UJ		16	J	36	UJ	
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	93		130		33.18	130	J-	140	J-	7.41
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	180		250		32.56	220	J-	230	J-	4.44
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	180	J	400	J	75.86	340	J-	370	J-	8.45
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
Calculated	PCB	Total PCBs	ug/kg	T	450	J	780	J	53.66	690	J-	740	J-	6.99
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T										
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T										
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T										
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T										
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T										
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T										
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T										
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T										
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T										
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T										
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T										
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T										
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T										
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T										
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T										
SW8290	3268-87-9	OCDD	NG/KG	T										
SW8290	39001-02-0	OCDF	NG/KG	T										

					2020_Sport-03B				
				Location ID	OL-F-7A		OL-F-7A		
				Field Sample ID	OL-3230-04F		OL-3230-04FDUP		
				Sample Name	OL-F-7A-20-CCP-01		OL-F-7A-20-CCP-01		
				Sampled	7/17/2020		7/17/2020		
				SDG	410-3728-7		410-3728-7		
				Lab Sample ID	410-9225-4		410-9225-6		
				Medium	Tissue		Tissue		
				Sample Type	REG		FD		Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT		
Method	Parameter Code	Parameter Name	Units	Fraction					
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	1.4	JN	1.4	J	
SW8081	72-54-8	4,4'-DDD	ug/kg	T					
SW8081	72-55-9	4,4'-DDE	ug/kg	T					
SW8081	50-29-3	4,4'-DDT	ug/kg	T					
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	34	U	34	U	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	34	U	34	U	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	34	U	34	U	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	34	U	34	U	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	57		53		7.27
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	78		75		3.92
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	110	J	110		0.00
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	34	U	34	U	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	34	U	34	U	
Calculated	PCB	Total PCBs	ug/kg	T	250	J	240		4.08
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T					
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T					
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T					
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T					
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T					
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T					
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T					
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T					
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T					
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T					
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T					
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T					
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T					
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T					
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T					
SW8290	3268-87-9	OCDD	NG/KG	T					
SW8290	39001-02-0	OCDF	NG/KG	T					

					2020_Sport-01					2020_Sport-04				
				Location ID	OL-F-1A		OL-F-1A			OL-F-2A		OL-F-2A		
				Field Sample ID	OL-3229-05F		OL-3229-05FDUP			OL-3222-11F		OL-3222-11DUP		
				Sample Name	OL-F-1A-20-CCP-03		OL-F-1A-20-CCP-03			OL-F-2A-20-WALL-01		OL-F-2A-20-WALL-01		
				Sampled	7/14/2020		7/14/2020			6/1/2020		6/1/2020		
				SDG	410-3728-4		410-3728-4			410-3728-2		410-3728-2		
				Lab Sample ID	410-7904-5		410-7904-7			410-3939-27		410-3939-28		
				Medium	Tissue		Tissue			Tissue		Tissue		
				Sample Type	REG		FD		Relative Percent Difference (RPD)	REG		FD		Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT			T-FT		T-FT		
Method	Parameter Code	Parameter Name	Units	Fraction										
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	31	U	30	U		30	U	31	U	
SW8081	72-54-8	4,4'-DDD	ug/kg	T										
SW8081	72-55-9	4,4'-DDE	ug/kg	T										
SW8081	50-29-3	4,4'-DDT	ug/kg	T										
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	640		600		6.45	33	U	34	U	
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	990	J	880		11.76	130		160		20.69
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	630		780		21.28	33	U	34	U	
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	170	U	170	U		33	U	34	U	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	170	U	170	U		33	U	34	U	
Calculated	PCB	Total PCBs	ug/kg	T	2300		2300		0.00	130		160		20.69
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T	1.9	J	2.1	J						
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T	0.12	U	0.19	U						
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T	0.14	U	0.21	U						
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T	0.4	J	0.4	J						
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T	0.71	J	0.72	J						
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T	2.6	J	2.5	J						
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T	4.6	J	2.2	J						
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T	0.49	J	0.42	J						
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T	0.051	U	0.03	U						
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T	6.3	J	6.1	J						
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T	0.17	U	0.15	U						
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T	0.65	J	0.66	J						
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T	5.7		5.5		3.57					
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T	0.23	J	0.03	U						
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T	1.5		1.5		0.00					
SW8290	3268-87-9	OCDD	NG/KG	T	2.2	J	2.4	J						
SW8290	39001-02-0	OCDF	NG/KG	T	0.1	J	0.17	J						

					2020_Prey-02					2020_Sport-03A				
				Location ID	OL-F-2A		OL-F-2A			OL-F-3A		OL-F-3A		
				Field Sample ID	OL-3234-04		OL-3234-04DUP			OL-3226-07F		OL-3226-07FDUP		
				Sample Name	OL-F-2A-20-RG-01		OL-F-2A-20-RG-01			OL-F-3A-20-CCP-03		OL-F-3A-20-CCP-03		
				Sampled	8/6/2020		8/6/2020			6/30/2020		6/30/2020		
				SDG	410-10894-1		410-10894-1			410-3728-6		410-3728-6		
				Lab Sample ID	410-10894-4		410-10894-21			410-6500-7		410-6500-8		
				Medium	Tissue		Tissue			Tissue		Tissue		
				Sample Type	REG		FD		Relative Percent Difference (RPD)	REG		FD		Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT			T-FT		T-FT		
Method	Parameter Code	Parameter Name	Units	Fraction										
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	1.7	U	1.6	U		31	UJ	31	UJ	
SW8081	72-54-8	4,4'-DDD	ug/kg	T	3.4	U	3.4	U						
SW8081	72-55-9	4,4'-DDE	ug/kg	T	3.4	UJ	1.9	J						
SW8081	50-29-3	4,4'-DDT	ug/kg	T	3.4	U	3.4	U						
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	49	J-	23	J	72.22	190	J-	210	J-	10.00
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	43		30	J	35.62	180	J-	190	J-	5.41
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	43		30	J	35.62	83	J-	90	J-	8.09
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	34	U	34	U		34	UJ	34	UJ	
Calculated	PCB	Total PCBs	ug/kg	T	140	J-	83	J-	51.12	450	J-	490	J-	8.51
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T						1.8	J	2.3	JB	
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T						3.2	J	0.71	JB	
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T						0.14	U	0.17	JB	
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T						0.25	J	0.33	JB	
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T						0.29	J	0.44	JB	
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T						0.91	J	0.97	JB	
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T						0.26	J	0.53	JB	
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T						0.056	U	0.26	JB	
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T						0.052	U	0.088	JB	
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T						0.78	J	0.62	J	
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T						0.11	U	0.72	JB	
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T						0.23	J	0.24	JB	
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T						4.4	J	3.4	JB	
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T						0.05	U	0.019	U	
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T						2.8		3.1		10.17
SW8290	3268-87-9	OCDD	NG/KG	T						5.3	J	6.3	JB	
SW8290	39001-02-0	OCDF	NG/KG	T						0.039	U	0.26	JB	

					2020_Sport-02				2020_Sport-05				
				Location ID	OL-F-4A		OL-F-4A			OL-F-5A		OL-F-5A	
				Field Sample ID	OL-3223-04F		OL-3223-04FDUP			OL-3220-04F		OL-3220-04DUP	
				Sample Name	OL-F-4A-20-CCP-03		OL-F-4A-20-CCP-03			OL-F-5A-20-CCP-01		OL-F-5A-20-CCP-01	
				Sampled	6/4/2020		6/4/2020			5/18/2020		5/18/2020	
				SDG	410-3728-5		410-3728-5			410-3728-3		410-3728-3	
				Lab Sample ID	410-3939-5		410-3939-38			410-3728-4		410-3728-5	
				Medium	Tissue		Tissue			Tissue		Tissue	
				Sample Type	REG		FD		Relative Percent Difference (RPD)	REG		FD		Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT			T-FT		T-FT		
Method	Parameter Code	Parameter Name	Units	Fraction										
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	15	U	15	U		31	U	30	U	
SW8081	72-54-8	4,4'-DDD	ug/kg	T										
SW8081	72-55-9	4,4'-DDE	ug/kg	T										
SW8081	50-29-3	4,4'-DDT	ug/kg	T										
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	260		270		3.77	170	U	170	U	
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	200		230		13.95	700	J	790	J	12.08
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	140	J	34	U		170	U	170	U	
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	34	U	34	U		170	U	170	U	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	34	U	34	U		170	U	170	U	
Calculated	PCB	Total PCBs	ug/kg	T	600		500		18.18	700		790		12.08
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T	1.2	J	1.3	J						
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T	1.4	J	2.2	JB						
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T	0.035	U	0.065	U						
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T	0.13	J	0.17	JB						
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T	0.18	J	0.39	JB						
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T	0.49	J	0.54	JB						
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T	2	J	1.2	JB						
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T	0.18	J	0.21	JB						
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T	0.025	U	0.02	U						
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T	1	J	1.1	J						
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T	0.45	J	0.78	JB						
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T	0.22	J	0.2	J						
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T	0.64	J	0.93	JB						
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T	0.082	J	0.083	J						
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T	3.2		3.7		14.49					
SW8290	3268-87-9	OCDD	NG/KG	T	1.2	J	1.6	JB						
SW8290	39001-02-0	OCDF	NG/KG	T	0.064	JB	0.051	JB						

					2020_Prey-01				2020_Prey-03			
				Location ID	OL-F-5A		OL-F-5A		OL-F-6A		OL-F-6A	
				Field Sample ID	OL-3231-05		OL-3231-05DUP		OL-3237-05		OL-3237-05DUP	
				Sample Name	OL-F-5A-20-SHRH-01		OL-F-5A-20-SHRH-01		OL-F-6A-20-WHS-03		OL-F-6A-20-WHS-03	
				Sampled	7/27/2020		7/27/2020		9/8/2020		9/8/2020	
				SDG	410-3728-1		410-3728-1		410-10903-1		410-10903-1	
				Lab Sample ID	410-9221-5		410-9221-9		410-16344-5		410-16344-6	
				Medium	Tissue		Tissue		Tissue		Tissue	
				Sample Type	REG		FD	Relative Percent Difference (RPD)	REG		FD	Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT		T-FT		T-FT	
Method	Parameter Code	Parameter Name	Units	Fraction								
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	8.2	U	33	U		15	UJ	30	UJ	
SW8081	72-54-8	4,4'-DDD	ug/kg	T	8.1	J	68	U		18	UJ	36	UJ	
SW8081	72-55-9	4,4'-DDE	ug/kg	T	76		74		2.67	12	J	27	J	
SW8081	50-29-3	4,4'-DDT	ug/kg	T	17	UJ	68	UJ		16	J	36	UJ	
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	93		130		33.18	130	J-	140	J-	7.41
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	180		250		32.56	220	J-	230	J-	4.44
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	180	J	400	J	75.86	340	J-	370	J-	8.45
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	33	U	34	U		34	UJ	33	UJ	
Calculated	PCB	Total PCBs	ug/kg	T	450	J	780	J	53.66	690	J-	740	J-	6.99
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T										
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T										
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T										
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T										
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T										
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T										
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T										
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T										
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T										
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T										
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T										
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T										
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T										
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T										
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T										
SW8290	3268-87-9	OCDD	NG/KG	T										
SW8290	39001-02-0	OCDF	NG/KG	T										

					2020_Sport-03B				
				Location ID	OL-F-7A		OL-F-7A		
				Field Sample ID	OL-3230-04F		OL-3230-04FDUP		
				Sample Name	OL-F-7A-20-CCP-01		OL-F-7A-20-CCP-01		
				Sampled	7/17/2020		7/17/2020		
				SDG	410-3728-7		410-3728-7		
				Lab Sample ID	410-9225-4		410-9225-6		
				Medium	Tissue		Tissue		
				Sample Type	REG		FD		Relative Percent Difference (RPD)
				Matrix	T-FT		T-FT		
Method	Parameter Code	Parameter Name	Units	Fraction					
SW8081	118-74-1	Hexachlorobenzene	ug/kg	T	1.4	JN	1.4	J	
SW8081	72-54-8	4,4'-DDD	ug/kg	T					
SW8081	72-55-9	4,4'-DDE	ug/kg	T					
SW8081	50-29-3	4,4'-DDT	ug/kg	T					
SW8082	12674-11-2	Aroclor-1016	ug/kg	T	34	U	34	U	
SW8082	11104-28-2	Aroclor-1221	ug/kg	T	34	U	34	U	
SW8082	11141-16-5	Aroclor-1232	ug/kg	T	34	U	34	U	
SW8082	53469-21-9	Aroclor-1242	ug/kg	T	34	U	34	U	
SW8082	12672-29-6	Aroclor-1248	ug/kg	T	57		53		7.27
SW8082	11097-69-1	Aroclor-1254	ug/kg	T	78		75		3.92
SW8082	11096-82-5	Aroclor-1260	ug/kg	T	110	J	110		0.00
SW8082	37324-23-5	Aroclor-1262	ug/kg	T	34	U	34	U	
SW8082	11100-14-4	Aroclor-1268	ug/kg	T	34	U	34	U	
Calculated	PCB	Total PCBs	ug/kg	T	250	J	240		4.08
SW8290	35822-46-9	1,2,3,4,6,7,8-HpCDD	NG/KG	T					
SW8290	67562-39-4	1,2,3,4,6,7,8-HpCDF	NG/KG	T					
SW8290	55673-89-7	1,2,3,4,7,8,9-HpCDF	NG/KG	T					
SW8290	39227-28-6	1,2,3,4,7,8-HxCDD	NG/KG	T					
SW8290	70648-26-9	1,2,3,4,7,8-HxCDF	NG/KG	T					
SW8290	57653-85-7	1,2,3,6,7,8-HxCDD	NG/KG	T					
SW8290	57117-44-9	1,2,3,6,7,8-HxCDF	NG/KG	T					
SW8290	19408-74-3	1,2,3,7,8,9-HxCDD	NG/KG	T					
SW8290	72918-21-9	1,2,3,7,8,9-HxCDF	NG/KG	T					
SW8290	40321-76-4	1,2,3,7,8-PeCDD	NG/KG	T					
SW8290	57117-41-6	1,2,3,7,8-PeCDF	NG/KG	T					
SW8290	60851-34-5	2,3,4,6,7,8-HxCDF	NG/KG	T					
SW8290	57117-31-4	2,3,4,7,8-PeCDF	NG/KG	T					
SW8290	1746-01-6	2,3,7,8-TCDD	NG/KG	T					
SW8290	51207-31-9	2,3,7,8-Tcdf	NG/KG	T					
SW8290	3268-87-9	OCDD	NG/KG	T					
SW8290	39001-02-0	OCDF	NG/KG	T					

APPENDIX 3B – 2020 FISH TISSUE DATA USABILITY ASSESSMENT

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2020 HONEYWELL SYRACUSE FISH TISSUE DATA USABILITY ASSESSMENT MARCH 14, 2023 REVISED JULY 2024

Background and Overview

The Eurofins Lancaster Laboratories Environment Testing, LLC (ELLE) processing SOP was revised due to processing and homogenization that occurred with the processing of 2019 fish. and the SOP was subsequently approved by NYSDEC in February, 2022. Additional quality control (QC) protocols were enacted at ELLE to include sample sign off and batch QC inspection. This batch inspection included inspection of at least 2 samples per sample data group (SDG), using the homogenate evaluation criteria from the revised SOP.

In addition to the above QC protocols, Anne Burnham and Michaela Kenward (Parsons on behalf of Honeywell) conducted a laboratory visit in March 2022 at the start of 2020 fish processing. During this visit, 17 fish were processed. All fish types collected from Onondaga Lake were processed during this visit, including 4 small prey fish (3 Banded Killifish, 1 Round Goby), 5 large prey fish (3 White Sucker, 2 Shorthead Redhorse), and 8 sport fish (2 Walleye, 2 Smallmouth Bass, 2 Common Carp, and 2 Pumpkinseed). Detailed notes were taken and provided to ELLE to summarize which equipment was most effective by species.

The following memorandum discusses the usability assessment of fish tissue data from 2020 for Onondaga Lake following the identification of inconsistent homogenization of tissues at Eurofins Lancaster Environmental Testing, including the recommended path forward.

In 2020, fish tissue samples were collected from Onondaga Lake. Samples were shipped to ELLE and were kept in cold storage until processing and analysis of the samples began in March 2022. Samples for Onondaga Lake were processed and analyzed by ELLE in the months that followed.

Upon completion of analyses of 2020 fish tissue samples, a subset of remaining tissues was selected for split samples to be sent for analysis to laboratories contracted by New York State Department of Environmental Conservation (NYSDEC) based on mass availability. Split samples consisted of sport fish samples (Common Carp [*Cyprinus carpio*], Smallmouth Bass [*Micropterus dolomieu*], Walleye [*Sander vitreus*], Pumpkinseed [*Lepomis gibbosus*]), large prey fish samples (White Sucker [*Catostomus commersonii*]), and small prey fish samples (Banded Killifish [*Fundulus diaphanus*], Round Goby [*Neogobius melanostomus*]).

A video call was conducted on October 19, 2022 with Parsons/Honeywell and ELLE to review homogenate condition while splitting. During this call, one Smallmouth Bass sample (OL-3228-04F) was found to not adhere to the homogenate evaluation criteria outlined in the SOP due to the presence of numerous large skin tags.

Due to the above issue, a lab visit was conducted by Parsons staff on behalf of Honeywell on November 2, 2022 to review all 2020 fish, excluding those that were processed under Parsons oversight in March 2022. During this visit, remaining homogenate from 2020 samples from Onondaga Lake were examined to determine whether samples were appropriately homogenized. Additional details on how this determination was made are included below, along with the results of this inspection and discussions of usability of the 2020 fish data. In summary, it

was determined that all small prey fish samples and the majority of large prey fish are usable. In contrast, sport fish usability varied by species.

Methodologies for the Assessment of Homogenates

The following methodologies were utilized for inspecting remaining homogenate 2020 samples. Remaining mass was retrieved from cold storage, where it has been kept since analysis, and thawed to facilitate the review of the material for compliance with the criteria laid out in the SOP. Due to analysis activities being conducted in adjacent rooms at the laboratory, the contents of each sample were kept confined to the jar to the extent practical. Each jar was opened and evaluated with a tongue depressor to mix the homogenate and visually search for the presence of any pieces (tags) of skins, pieces of tissue that had not been broken down, or bones.

Procedure C from the revised ELLE processing SOP was used to determine usability of the homogenate. A summary of the criteria is as follows:

1. The sample must be uniform
2. There can be no discernable whole fish or fish organs.
3. Scales are acceptable on samples not subject to descaling[1]
4. Occasional occurrence of fins is acceptable (particularly in large prey fish samples)
5. As with rocks and twigs in soils samples, subsampling of the homogenate into aliquots (for analyses by various departments or for split samples with external labs) will avoid bones, fins, and scales to achieve a more homogenous sample biased toward tissue that accumulates contaminants.
6. Sport fish fillets (e.g., Smallmouth Bass, Walleye, Pumpkinseed), small sport fish with head and viscera removed, and small prey (forage) fish should be thoroughly mixed, with only occasional small pieces of skin or bone (e.g., 3 or fewer pieces less than 1 cm).
7. Carp are more difficult to homogenize, and the occasional piece of skin or bone are to be expected. A larger number of skin or bone (e.g., 4 to 6 pieces of 2 to 3 cm).
8. Large prey (forage) fish (individual whole-body samples) would be expected to have some larger pieces of skin or bone (e.g., 3 to 6 cm), as long as they are relatively evenly distributed.

Homogenate Assessment Results

Following the review of the 2020 homogenates it was determined that all small prey fish data and the majority of the large prey fish data are considered usable based on the review of the homogenates. It was determined that a portion of the sport fish data would not be considered usable due to incomplete homogenization. Overall usability by species is provided in Table 1. Details on usability by each sample, as well as photo documentation from the November 2022 laboratory visit, is provided in Attachments 1A through 1F.

Recommendations and Path Forward

Recommendations and path forward are as follows:

- Only 2020 data resulting from fish samples that were determined to be appropriately homogenized will be used and reported.

[1] Small and large prey fish are not subject to descaling.

- 2021 Onondaga Lake fish tissue, originally planned to be processed and analyzed at ELLE, have been transferred to SGS Wilmington and placed on frozen hold. The SGS Wilmington tissue processing SOP was accepted by NYSDEC on September 28, 2022.
- Following the approval of the 2022 Quality Assurance Plan, which includes fish processing by SGS Wilmington analysis by SGS Wilmington (dioxins/furans, lipids) and SGS Dayton (mercury, pesticides, PCBs, moisture), it is recommended that 2021 fish tissue processing and analysis commence.
- To account for the lack of organic contaminant data in the data set by not having complete 2020 data, 2021 and 2022 fish tissues should be analyzed for all analytes. Specifically, all sport fish samples will be analyzed for total mercury, PCBs, hexachlorobenzene, dioxins/furans (12 samples/species), lipids and percent moisture. All prey fish will be analyzed for mercury, PCBs, hexachlorobenzene, DDT/metabolites, lipids and percent moisture. Any prioritization for analyses, if mass is limited, will be in accordance with the Onondaga Lake Monitoring and Maintenance Plan (OLMMP). Analyses will be conducted in accordance with the Quality Assurance Project Plan (QAPP).

TABLE

TABLE 1. SUMMARY OF 2020 FISH DATA USABILITY FOR ONONDAGA LAKE

Fish Type/Species	Total Fish Collected	Total Fish Reviewed[1]	Passed Homogenate Inspection	Failed Homogenate Inspection	No Mass Remaining[2]	Percent Usable
Small Prey Fish	24	24	24	0	-	100.00%
Large Prey Fish	24	24	22	2	-	91.67%
Walleye	25	25	6	19	-	24.00%
Smallmouth Bass	25	25	13	12	-	52.00%
Common Carp	25	25	8	17	-	36.00%
Pumpkinseed	25	21	19	2	4	76.00%
TOTALS	148	144	92	52	4	62.16%

Notes

1. Review includes the two SDGs (410-10903-1, 410-3728-6) processed during March 2022 lab visit (all of which were adequately homogenized) as well as fish inspected during November 2022 audit.
2. Four Pumpkinseed samples had no remaining mass and were not able to be reviewed during November 2022 visit. Therefore, these were conservatively assumed to have been improperly homogenized.

ATTACHMENT 1A - ONONDAGA LAKE 2020 SMALL PREY FISH USABILITY TABLE AND PHOTOLOG

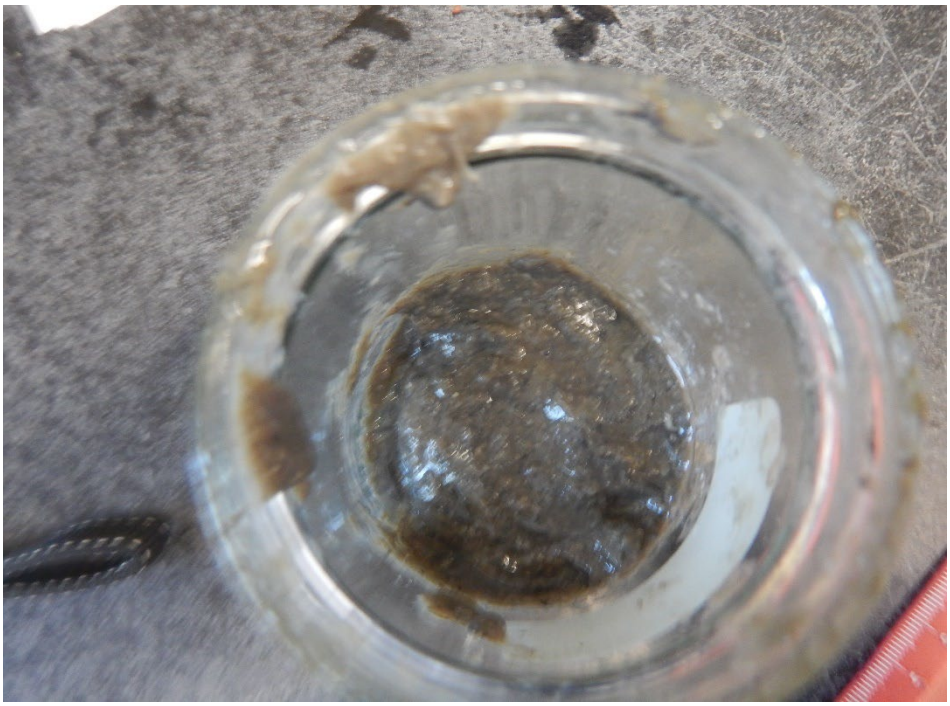
TABLE 1A. SUMMARY OF 2020 ONONDAGA LAKE FISH DATA USABILITY - SMALL PREY FISH

Sample Code	Sample Name	Location ID	Lab Sample ID	Lab SDG	Species	Usability
OL-3234-01	OL-F-1A-20-RG-01	OL-F-1A	410-10894-1	410-10894-1	Round Goby	Use
OL-3234-02	OL-F-1A-20-RG-02	OL-F-1A	410-10894-2	410-10894-1	Round Goby	Use
OL-3234-03	OL-F-1A-20-RG-03	OL-F-1A	410-10894-3	410-10894-1	Round Goby	Use
OL-3234-04	OL-F-2A-20-RG-01	OL-F-2A	410-10894-4	410-10894-1	Round Goby	Use
OL-3234-05	OL-F-2A-20-MIN-01	OL-F-2A	410-10894-5	410-10894-1	Banded Killifish	Use
OL-3234-06	OL-F-2A-20-MIN-02	OL-F-2A	410-10894-6	410-10894-1	Banded Killifish	Use
OL-3234-07	OL-F-3A-20-RG-01	OL-F-3A	410-10894-7	410-10894-1	Round Goby	Use
OL-3234-08	OL-F-3A-20-MIN-01	OL-F-3A	410-10894-8	410-10894-1	Banded Killifish	Use
OL-3234-09	OL-F-3A-20-RG-02	OL-F-3A	410-10894-9	410-10894-1	Round Goby	Use
OL-3234-11	OL-F-4A-20-MIN-02	OL-F-4A	410-10894-11	410-10894-1	Banded Killifish	Use
OL-3234-10	OL-F-4A-20-MIN-01	OL-F-4A	410-10894-10	410-10894-1	Banded Killifish	Use
OL-3234-12	OL-F-4A-20-MIN-03	OL-F-4A	410-10894-12	410-10894-1	Banded Killifish	Use
OL-3234-13	OL-F-5A-20-RG-01	OL-F-5A	410-10894-13	410-10894-1	Round Goby	Use
OL-3234-14	OL-F-5A-20-RG-02	OL-F-5A	410-10894-14	410-10894-1	Round Goby	Use
OL-3234-15	OL-F-5A-20-MIN-01	OL-F-5A	410-10894-15	410-10894-1	Banded Killifish	Use
OL-3234-16	OL-F-5B-20-MIN-01	OL-F-5B	410-10894-16	410-10894-1	Banded Killifish	Use
OL-3234-17	OL-F-5B-20-MIN-02	OL-F-5B	410-10894-17	410-10894-1	Banded Killifish	Use
OL-3234-18	OL-F-5B-20-MIN-03	OL-F-5B	410-10894-18	410-10894-1	Banded Killifish	Use
OL-3234-19	OL-F-6A-20-RG-01	OL-F-6A	410-10894-19	410-10894-1	Round Goby	Use
OL-3234-20	OL-F-6A-20-MIN-01	OL-F-6A	410-10894-20	410-10894-1	Banded Killifish	Use
OL-3235-01[1]	OL-F-6A-20-MIN-02	OL-F-6A	410-10903-1	410-10903-1	Banded Killifish	Use
OL-3235-02[1]	OL-F-7A-20-MIN-01	OL-F-7A	410-10903-2	410-10903-1	Banded Killifish	Use
OL-3235-03[1]	OL-F-7A-20-MIN-02	OL-F-7A	410-10903-3	410-10903-1	Banded Killifish	Use
OL-3235-04[1]	OL-F-7A-20-RG-01	OL-F-7A	410-10903-4	410-10903-1	Round Goby	Use

Notes

1. SDG 410-10903-1 was processed during March 2022 lab visit with Parsons oversight. As such, these samples are considered usable and were not evaluated during November 2022 lab visit.

ONONDAGA LAKE 2020 SMALL PREY FISH - USE



0L-3234-01 (0L-F-1A-20-RG-01)

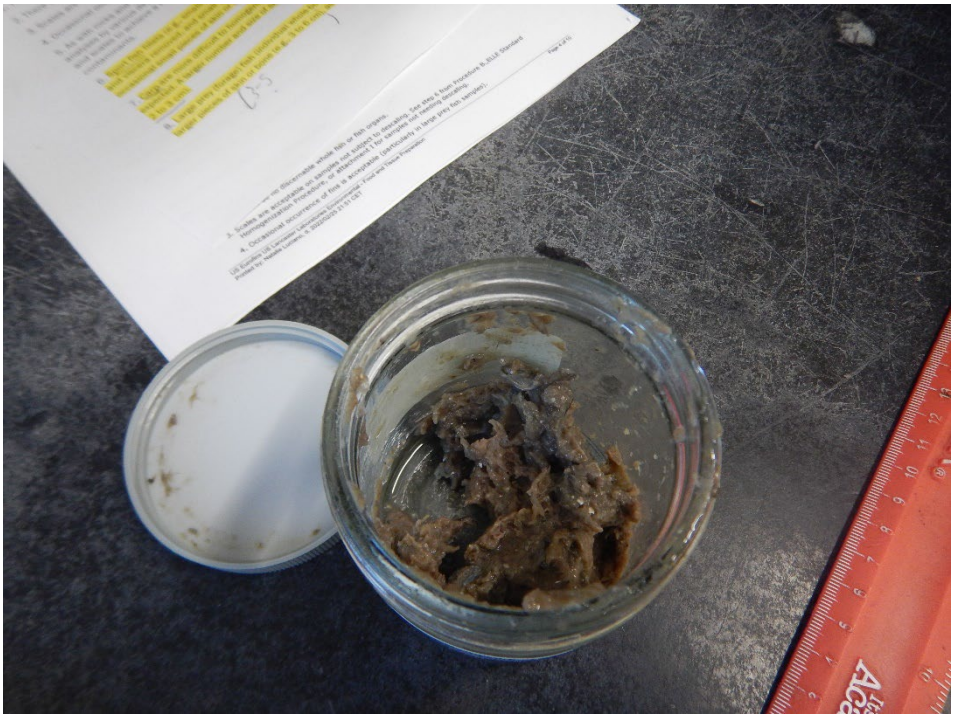


0L-3234-02 (0L-F-1A-20-RG-02)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE

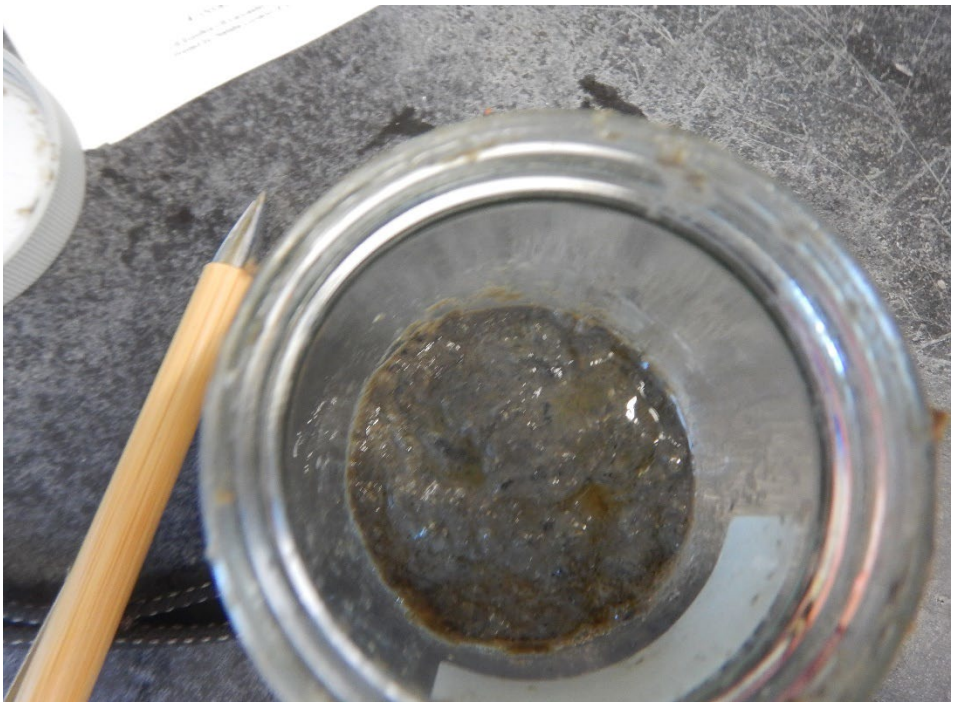


0L-3234-03 (0L-F-1A-20-RG-03)

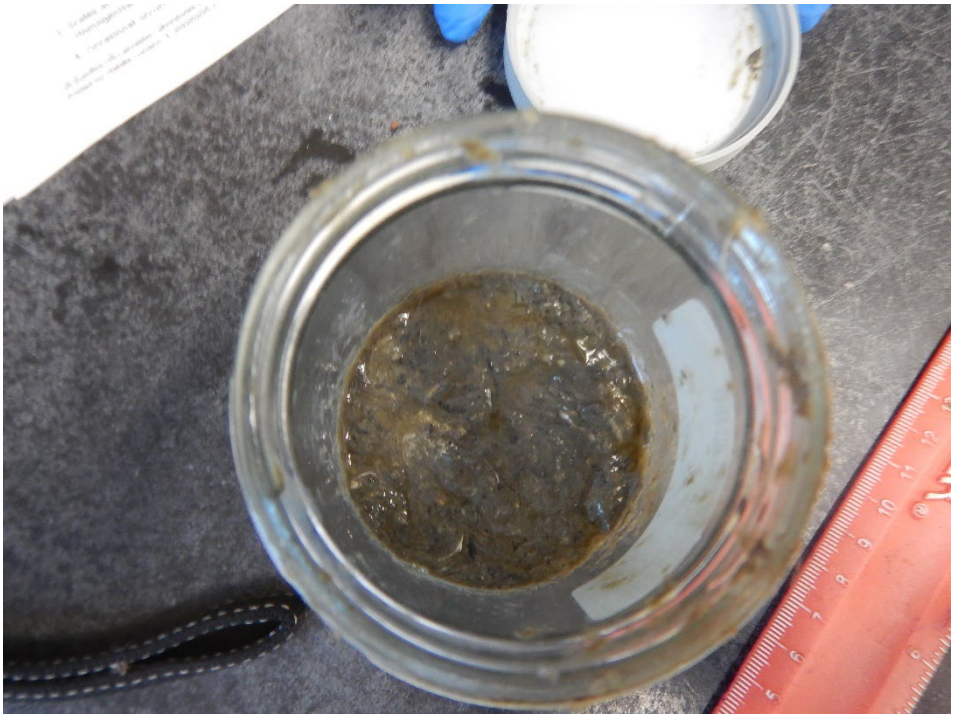


0L-3234-04 (0L-F-2A-20-RG-01)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE



0L-3234-05 (0L-F-2A-20-MIN-01)



0L-3234-06 (0L-F-2A-20-MIN-02)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE



0L-3234-07 (0L-F-3A-20-RG-01)



0L-3234-08 (0L-F-3A-20-MIN-01)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE

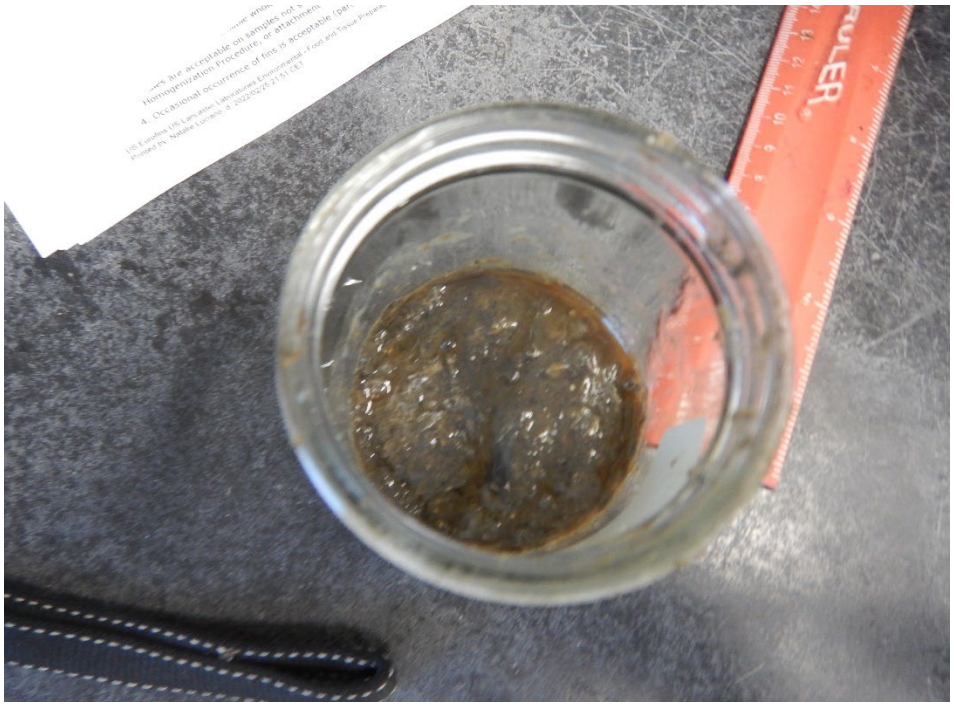


0L-3234-09 (0L-F-3A-20-RG-02)

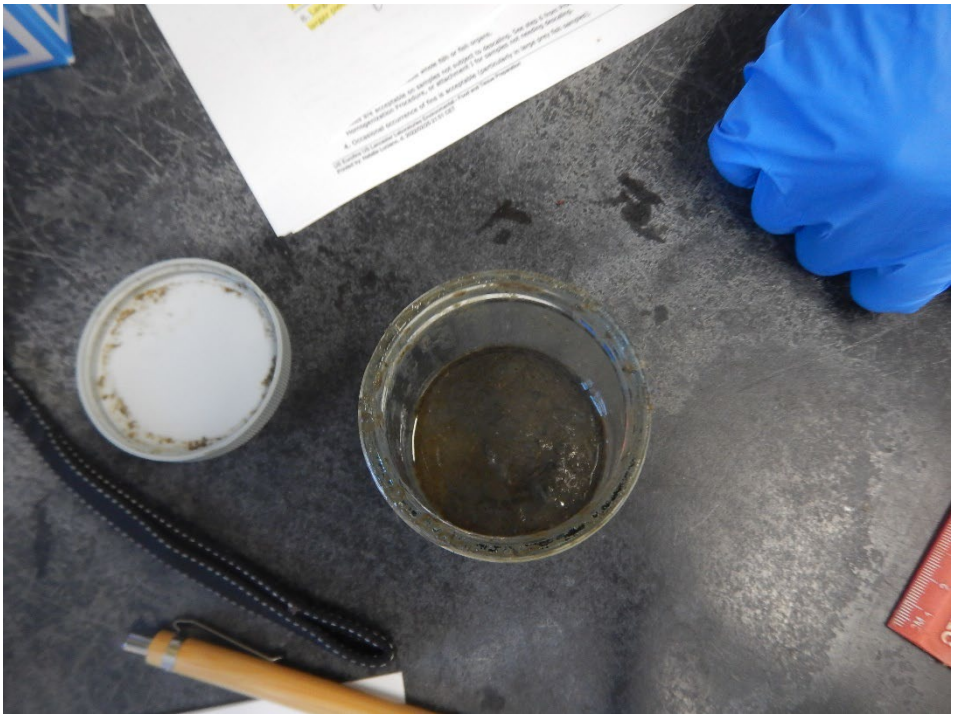


0L-3234-11 (0L-F-4A-20-MIN-02)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE



0L-3234-10 (0L-F-4A-20-MIN-01)



0L-3234-12 (0L-F-4A-20-MIN-03)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE



0L-3234-13 (0L-F-5A-20-RG-01)

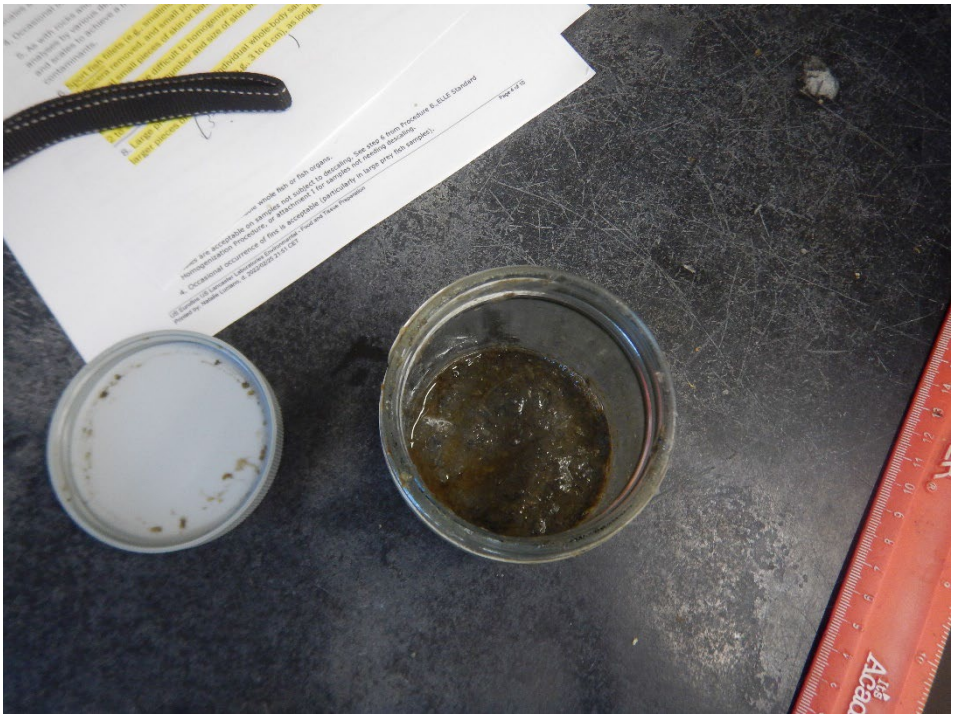


0L-3234-14 (0L-F-5A-20-RG-02)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE

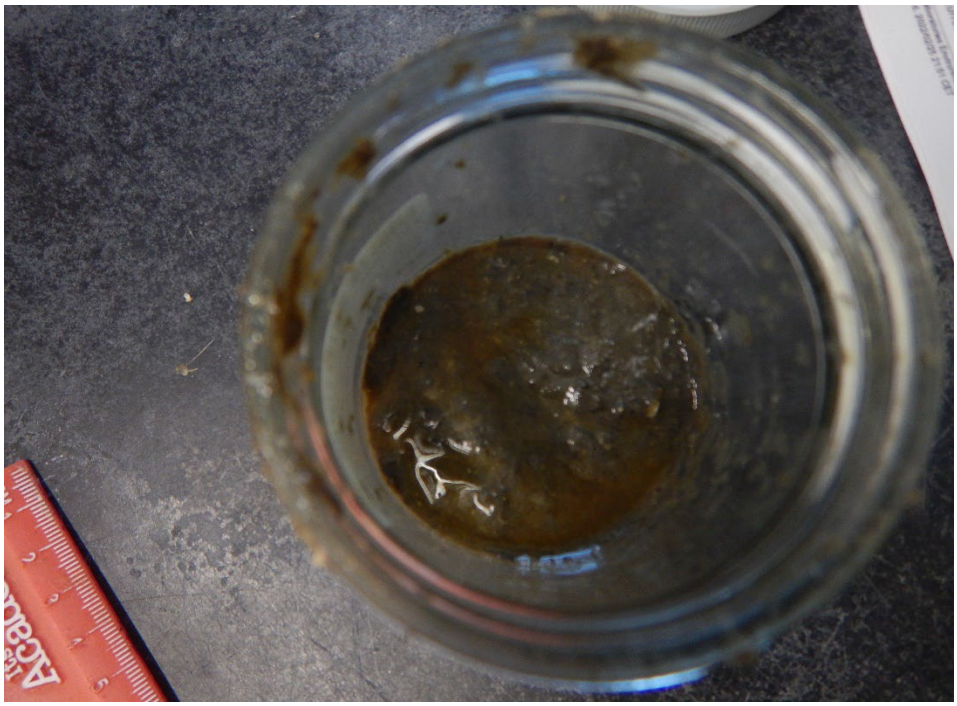


0L-3234-15 (0L-F-5A-20-MIN-01)

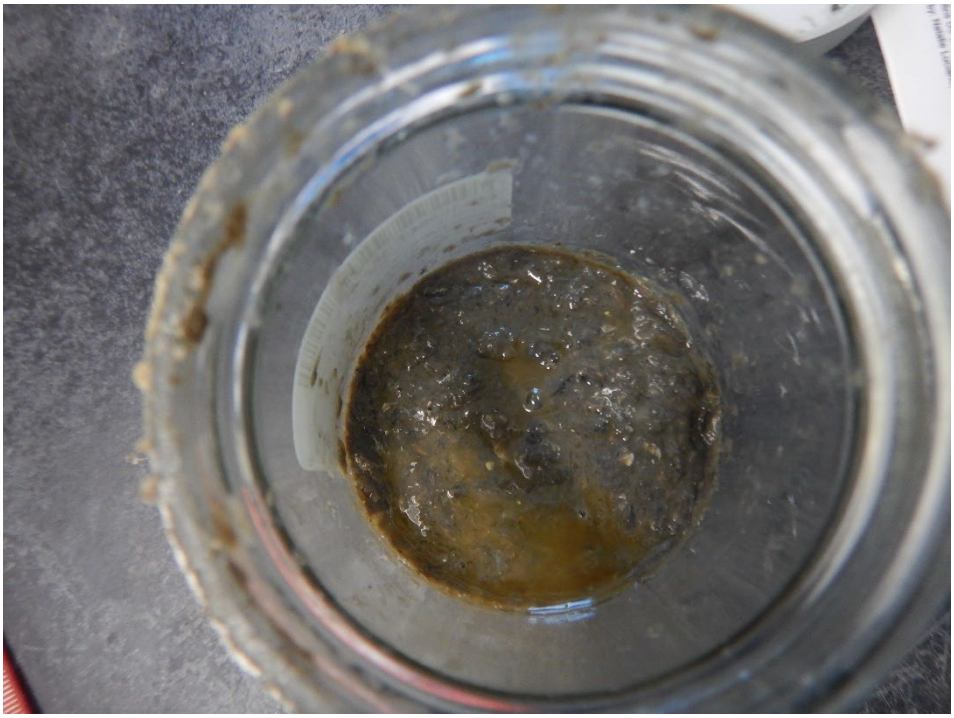


0L-3234-16 (0L-F-5B-20-MIN-01)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE

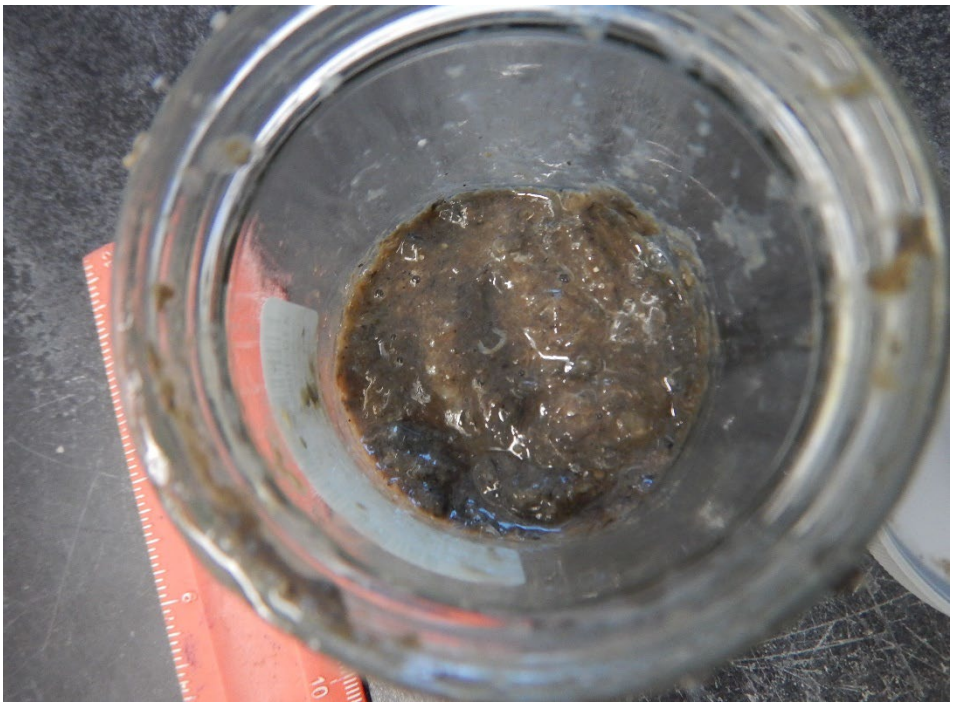


0L-3234-17 (0L-F-5B-20-MIN-02)

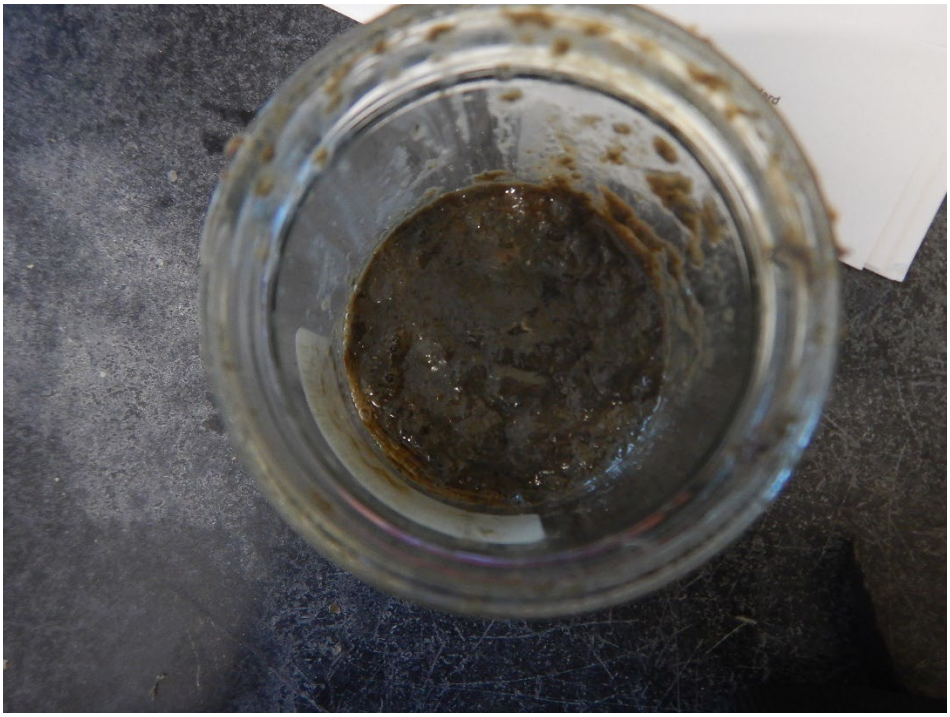


0L-3234-18 (0L-F-5B-20-MIN-03)

ONONDAGA LAKE 2020 SMALL PREY FISH - USE



0L-3234-19 (0L-F-6A-20-RG-01)



0L-3234-20 (0L-F-6A-20-MIN-01)

ATTACHMENT 1B - ONONDAGA LAKE 2020 LARGE PREY FISH USABILITY TABLE AND PHOTOLOG

TABLE 1B. SUMMARY OF 2020 ONONDAGA LAKE FISH DATA USABILITY - LARGE PREY FISH

Sample Code	Sample Name	Location ID	Lab Sample ID	Lab SDG	Species	Usability
OL-3221-08	OL-F-1A-20-WHS-01	OL-F-1A	410-3728-29	410-3728-1	White Sucker	Use
OL-3221-06	OL-F-2A-20-WHS-01	OL-F-2A	410-3728-27	410-3728-1	White Sucker	Use
OL-3231-01	OL-F-2A-20-SHRH-01	OL-F-2A	410-9221-1	410-3728-1	Shorthead Redhorse	Don't Use
OL-3231-02	OL-F-2A-20-SHRH-02	OL-F-2A	410-9221-2	410-3728-1	Shorthead Redhorse	Use
OL-3231-03	OL-F-2A-20-SHRH-03	OL-F-2A	410-9221-3	410-3728-1	Shorthead Redhorse	Use
OL-3221-01	OL-F-3A-20-WHS-01	OL-F-3A	410-3728-22	410-3728-1	White Sucker	Use
OL-3227-01	OL-F-3A-20-WHS-02	OL-F-3A	410-6500-12	410-3728-1	White Sucker	Use
OL-3231-07	OL-F-3A-20-SHRH-01	OL-F-3A	410-9221-7	410-3728-1	Shorthead Redhorse	Use
OL-3231-08	OL-F-3A-20-SHRH-02	OL-F-3A	410-9221-8	410-3728-1	Shorthead Redhorse	Use
OL-3237-01[1]	OL-F-3A-20-SHRH-03	OL-F-3A	410-16344-1	410-10903-1	Shorthead Redhorse	Use
OL-3221-07	OL-F-4A-20-WHS-01	OL-F-4A	410-3728-28	410-3728-1	White Sucker	Use
OL-3231-04	OL-F-4A-20-SHRH-01	OL-F-4A	410-9221-4	410-3728-1	Shorthead Redhorse	Use
OL-3221-09	OL-F-5A-20-WHS-01	OL-F-5A	410-3728-30	410-3728-1	White Sucker	Use
OL-3231-05	OL-F-5A-20-SHRH-01	OL-F-5A	410-9221-5	410-3728-1	Shorthead Redhorse	Use
OL-3231-06	OL-F-5A-20-SHRH-02	OL-F-5A	410-9221-6	410-3728-1	Shorthead Redhorse	Use
OL-3221-02	OL-F-5B-20-WHS-01	OL-F-5B	410-3728-23	410-3728-1	White Sucker	Use
OL-3221-03	OL-F-5B-20-WHS-02	OL-F-5B	410-3728-24	410-3728-1	White Sucker	Use
OL-3237-02[1]	OL-F-5B-20-SHRH-01	OL-F-5B	410-16344-2	410-10903-1	Shorthead Redhorse	Use
OL-3237-03[1]	OL-F-5B-20-WHS-03	OL-F-5B	410-16344-3	410-10903-1	White Sucker	Use
OL-3237-04[1]	OL-F-5B-20-WHS-04	OL-F-5B	410-16344-4	410-10903-1	White Sucker	Use
OL-3221-04	OL-F-6A-20-WHS-01	OL-F-6A	410-3728-25	410-3728-1	White Sucker	Use
OL-3221-05	OL-F-6A-20-WHS-02	OL-F-6A	410-3728-26	410-3728-1	White Sucker	Use
OL-3237-05[1]	OL-F-6A-20-WHS-03	OL-F-6A	410-16344-5	410-10903-1	White Sucker	Use
OL-3232-01	OL-F-7A-20-WHS-01	OL-F-7A	410-10901-1	410-3728-1	White Sucker	Don't Use

Notes

1. SDG 410-10903-1 was processed during March 2022 lab visit with Parsons oversight. As such, these samples are considered usable and were not evaluated during November 2022 lab visit.

ONONDAGA LAKE 2020 LARGE PREY FISH - USE

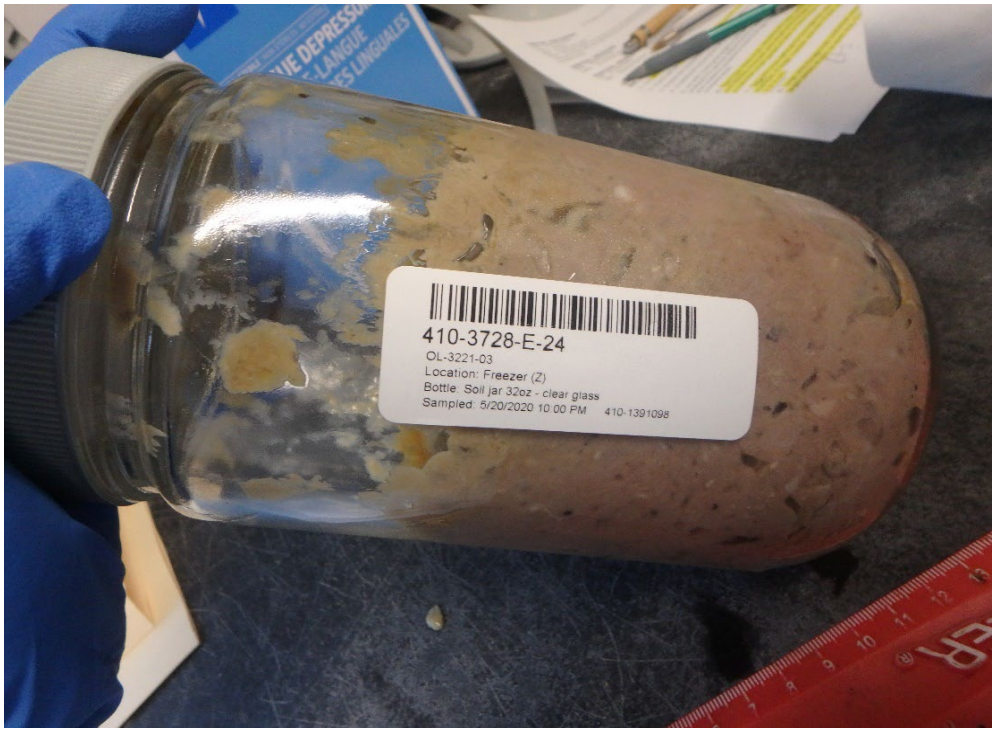


0L-3221-01 (0L-F-3A-20-WHS-01)



0L-3221-02 (0L-F-5B-20-WHS-01)

ONONDAGA LAKE 2020 LARGE PREY FISH - USE



0L-3221-03 (0L-F-5B-20-WHS-02)



0L-3221-04 (0L-F-6A-20-WHS-01)

ONONDAGA LAKE 2020 LARGE PREY FISH - USE

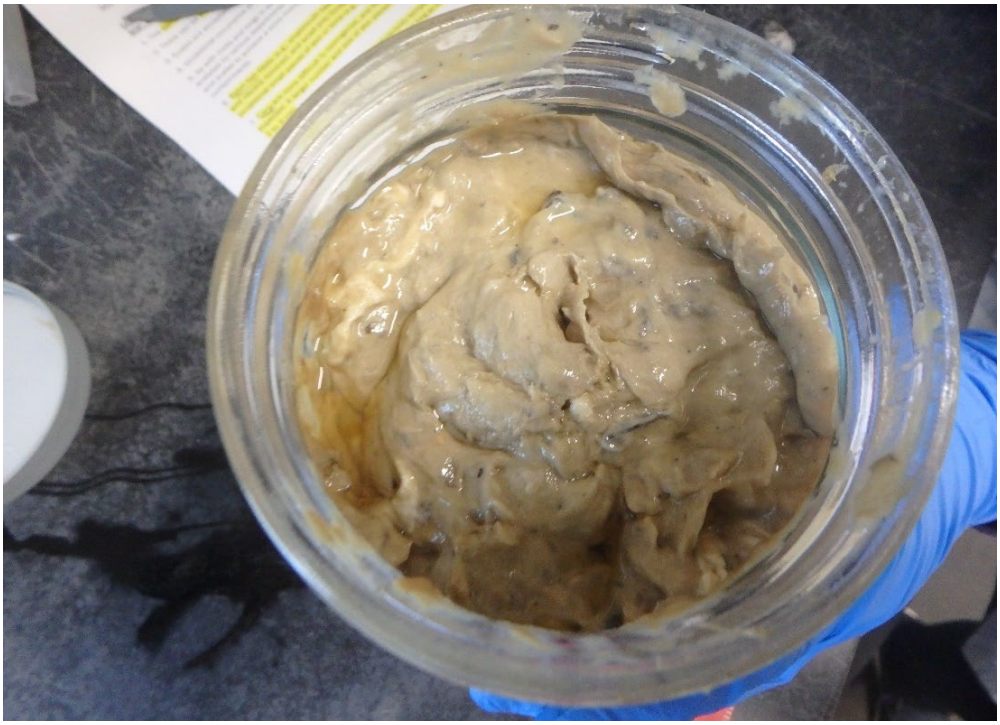


0L-3221-05 (0L-F-6A-20-WHS-02)



0L-3221-06 (0L-F-2A-20-WHS-01)

ONONDAGA LAKE 2020 LARGE PREY FISH - USE



0L-3221-07 (0L-F-4A-20-WHS-01)



0L-3221-08 (0L-F-1A-20-WHS-01)

ONONDAGA LAKE 2020 LARGE PREY FISH – USE



0L-3221-09 (0L-F-5A-20-WHS-01)



0L-3227-01 (0L-F-3A-20-WHS-02)

ONONDAGA LAKE 2020 LARGE PREY FISH - USE



OL-3231-02 (OL-F-2A-20-SHRH-02)



OL-3231-03 (OL-F-2A-20-SHRH-03)

ONONDAGA LAKE 2020 LARGE PREY FISH - USE



0L-3231-04 (0L-F-4A-20-SHRH-01)



0L-3231-06 (0L-F-5A-20-SHRH-02)

ONONDAGA LAKE 2020 LARGE PREY FISH - USE



0L-3231-07 (0L-F-3A-20-SHRH-01)



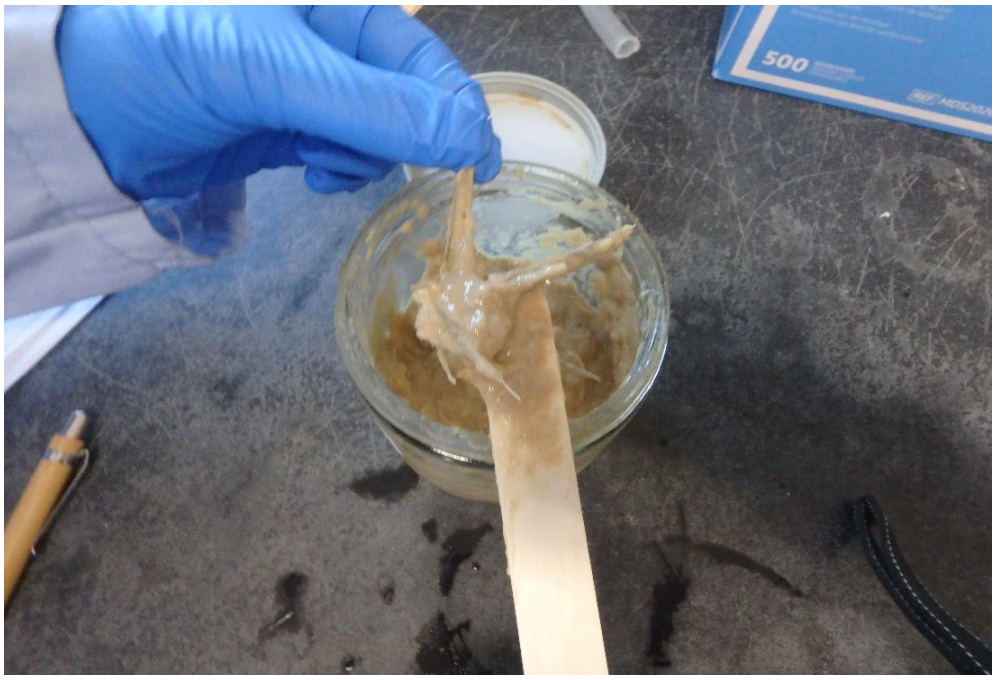
0L-3231-08 (0L-F-3A-20-SHRH-02)

ONONDAGA LAKE 2020 LARGE PREY FISH - USE



0L-3231-05 (0L-F-5A-20-SHRH-01)

ONONDAGA LAKE 2020 LARGE PREY FISH - DO NOT USE



0L-3231-01 (0L-F-2A-20-SHRH-01)



0L-3232-01 (0L-F-7A-20-WHS-01)

ATTACHMENT 1C - ONONDAGA LAKE 2020 WALLEYE USABILITY TABLE AND PHOTOLOG

TABLE 1C. SUMMARY OF 2020 ONONDAGA LAKE FISH DATA USABILITY - WALLEYE

Sample Code	Sample Name	Location ID	Lab Sample ID	Lab SDG	Species	Usability
OL-3220-10F	OL-F-1A-20-WALL-01	OL-F-1A	410-3728-11	410-3728-2	Walleye	Use
OL-3220-11F	OL-F-1A-20-WALL-02	OL-F-1A	410-3728-12	410-3728-4	Walleye	Use
OL-3220-12F	OL-F-1A-20-WALL-03	OL-F-1A	410-3728-13	410-3728-2	Walleye	Don't Use
OL-3223-01F	OL-F-2A-20-WALL-04	OL-F-2A	410-3939-1	410-3728-4	Walleye	Don't Use
OL-3222-11F	OL-F-2A-20-WALL-01	OL-F-2A	410-3939-27	410-3728-2	Walleye	Don't Use
OL-3222-12F	OL-F-2A-20-WALL-02	OL-F-2A	410-3939-29	410-3728-7	Walleye	Use
OL-3222-13F	OL-F-2A-20-WALL-03	OL-F-2A	410-3939-30	410-3728-5	Walleye	Don't Use
OL-3222-16F	OL-F-3A-20-WALL-01	OL-F-3A	410-3939-33	410-3728-2	Walleye	Don't Use
OL-3222-17F	OL-F-3A-20-WALL-02	OL-F-3A	410-3939-34	410-3728-2	Walleye	Don't Use
OL-3222-18F	OL-F-3A-20-WALL-03	OL-F-3A	410-3939-35	410-3728-5	Walleye	Don't Use
OL-3222-02F	OL-F-4A-20-WALL-01	OL-F-4A	410-3939-18	410-3728-4	Walleye	Use
OL-3222-20F	OL-F-4A-20-WALL-02	OL-F-4A	410-3939-37	410-3728-4	Walleye	Don't Use
OL-3223-07F	OL-F-4A-20-WALL-03	OL-F-4A	410-3939-8	410-3728-7	Walleye	Don't Use
OL-3220-06F	OL-F-5A-20-WALL-01	OL-F-5A	410-3728-7	410-3728-2	Walleye	Don't Use
OL-3220-18F	OL-F-5A-20-WALL-02	OL-F-5A	410-3728-19	410-3728-5	Walleye	Don't Use
OL-3220-19F	OL-F-5A-20-WALL-03	OL-F-5A	410-3728-20	410-3728-5	Walleye	Don't Use
OL-3220-20F	OL-F-5A-20-WALL-04	OL-F-5A	410-3728-21	410-3728-2	Walleye	Don't Use
OL-3220-08F	OL-F-5B-20-WALL-01	OL-F-5B	410-3728-9	410-3728-4	Walleye	Don't Use
OL-3222-08F	OL-F-5B-20-WALL-02	OL-F-5B	410-3939-24	410-3728-2	Walleye	Don't Use
OL-3222-09F	OL-F-5B-20-WALL-03	OL-F-5B	410-3939-25	410-3728-5	Walleye	Don't Use
OL-3220-09F	OL-F-6A-20-WALL-01	OL-F-6A	410-3728-10	410-3728-2	Walleye	Don't Use
OL-3223-15F	OL-F-6A-20-WALL-02	OL-F-6A	410-3939-16	410-3728-2	Walleye	Don't Use
OL-3220-14F[1]	OL-F-7A-20-WALL-01	OL-F-7A	410-3728-15	410-3728-6	Walleye	Use
OL-3220-15F	OL-F-7A-20-WALL-02	OL-F-7A	410-3728-16	410-3728-7	Walleye	Don't Use
OL-3220-16F[1]	OL-F-7A-20-WALL-03	OL-F-7A	410-3728-17	410-3728-6	Walleye	Use

Notes

1. SDG 410-3728-6 was processed during March 2022 lab visit with Parsons oversight. As such, these samples are considered usable and were not evaluated during November 2022 lab visit.

ONONDAGA LAKE 2020 WALLEYE- USE



OL-3220-10F (OL-F-1A-20-WALL-01)



OL-3220-11F (OL-F-1A-20-WALL-02)

ONONDAGA LAKE 2020 WALLEYE- USE



OL-3222-02F (OL-F-4A-20-WALL-01)



OL-3222-12F (OL-F-2A-20-WALL-02)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE

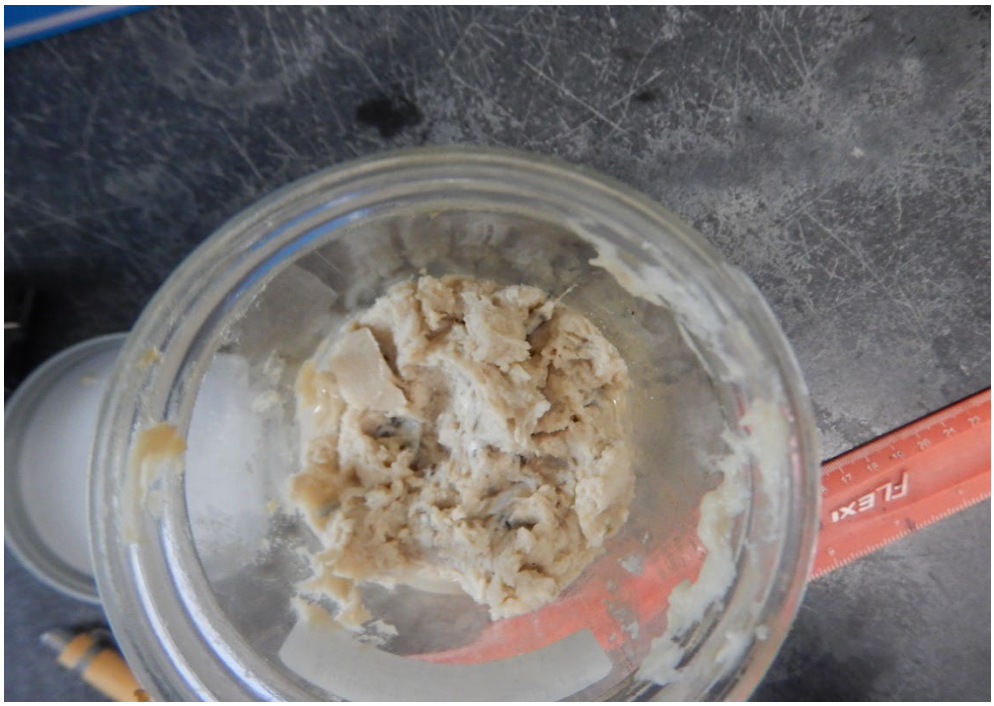


OL-3220-06F (OL-F-5A-20-WALL-01)



OL-3220-08F (OL-F-5B-20-WALL-01)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE



OL-3220-09F (OL-F-6A-20-WALL-01)



OL-3220-12F (OL-F-1A-20-WALL-03)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE

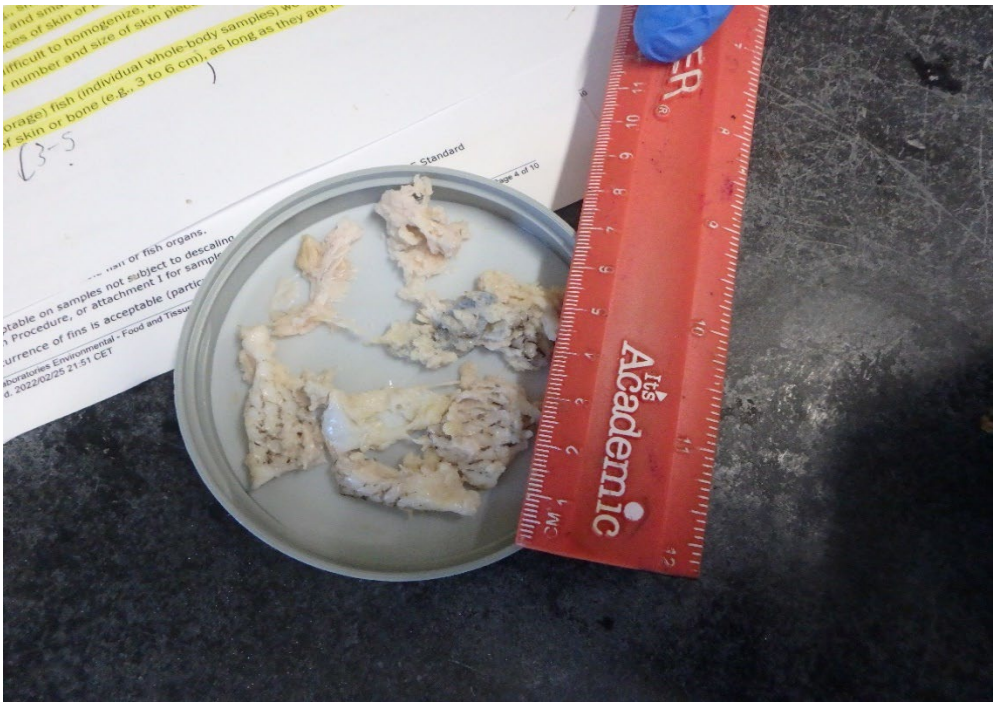


OL-3220-15F (OL-F-7A-20-WALL-02)



OL-3220-18F (OL-F-5A-20-WALL-02)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE



OL-3220-19F (OL-F-5A-20-WALL-03)



OL-3220-20F (OL-F-5A-20-WALL-04)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE

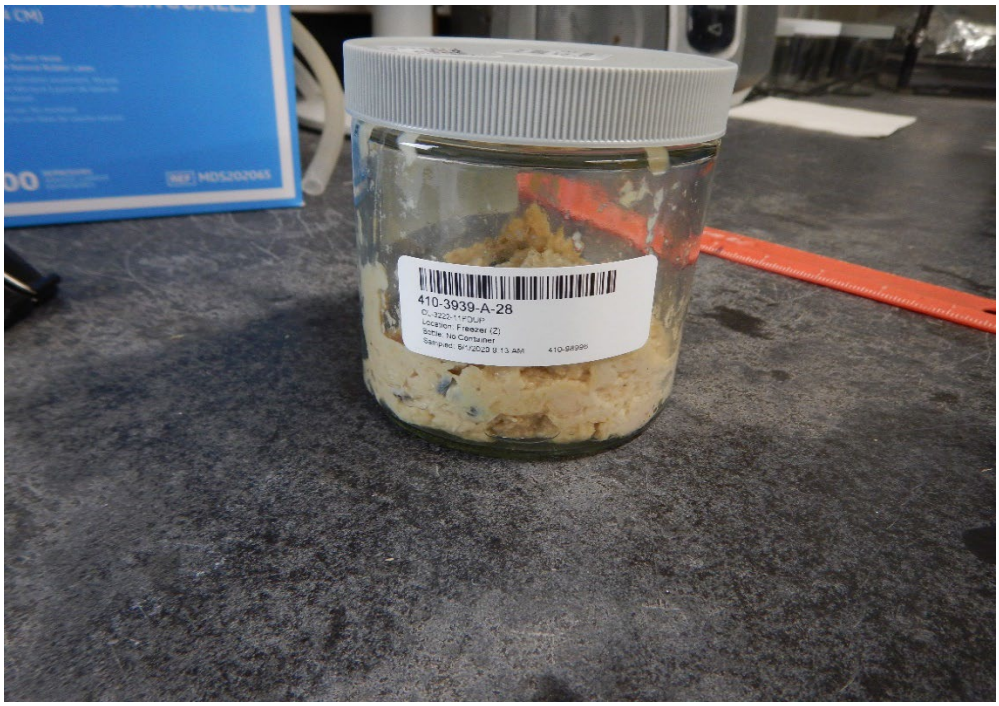


0L-3222-08F (0L-F-5B-20-WALL-02)



0L-3222-09F (0L-F-5B-20-WALL-03)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE

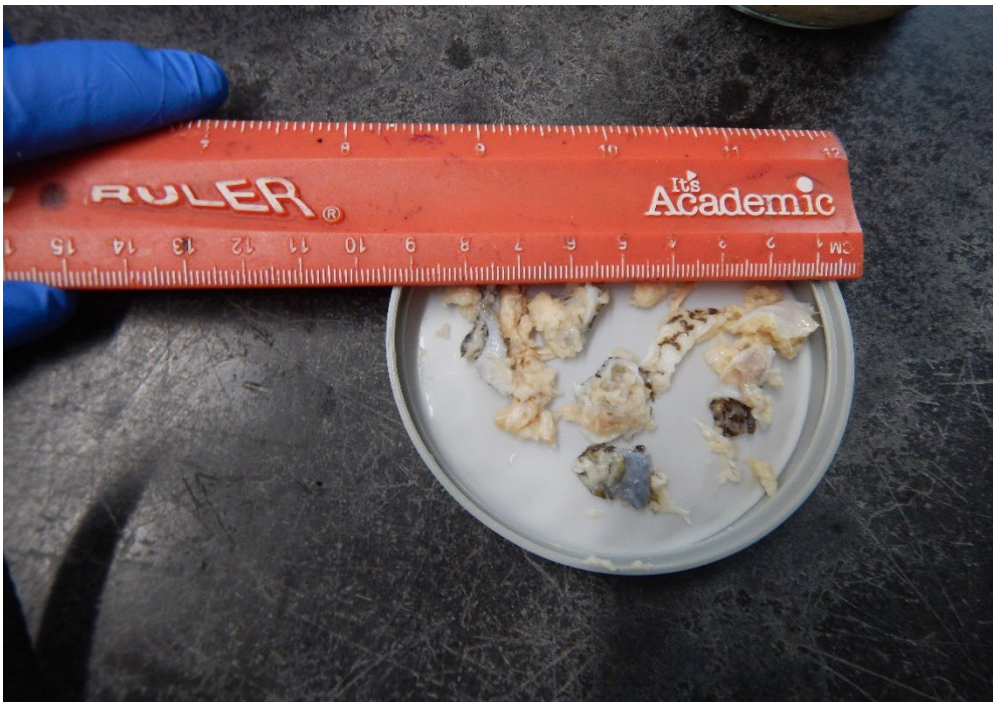


OL-3222-11F (OL-F-2A-20-WALL-01)



OL-3222-13F (OL-F-2A-20-WALL-03)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE



OL-3222-16F (OL-F-3A-20-WALL-01)



OL-3222-17F (OL-F-3A-20-WALL-02)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE



OL-3222-18F (OL-F-3A-20-WALL-03)



OL-3222-20F (OL-F-4A-20-WALL-02)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE



OL-3223-01F (OL-F-2A-20-WALL-04)



OL-3223-07F (OL-F-4A-20-WALL-03)

ONONDAGA LAKE 2020 WALLEYE- DO NOT USE



OL-3223-15F (OL-F-6A-20-WALL-02)

ATTACHMENT 1D - ONONDAGA LAKE 2020 SMALLMOUTH BASS USABILITY TABLE AND PHOTOLOG

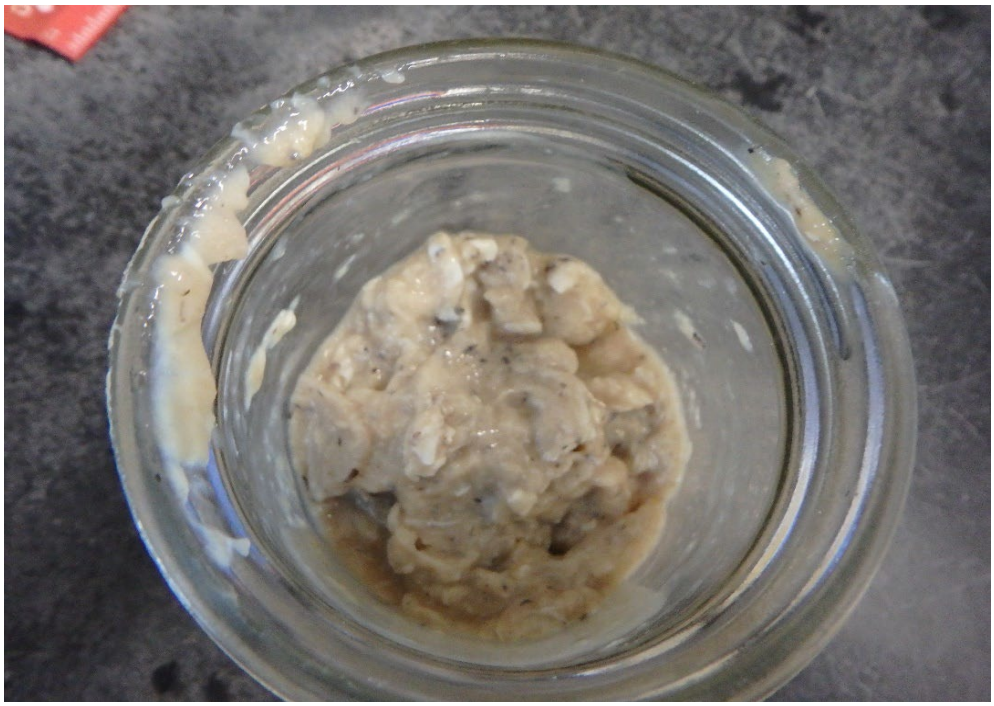
TABLE 1D. SUMMARY OF 2020 ONONDAGA LAKE FISH DATA USABILITY - SMALLMOUTH BASS

Sample Code	Sample Name	Location ID	Lab Sample ID	Lab SDG	Species	Usability
OL-3223-13F	OL-F-1A-20-SMB-01	OL-F-1A	410-3939-14	410-3728-3	Smallmouth Bass	Don't Use
OL-3223-14F	OL-F-1A-20-SMB-02	OL-F-1A	410-3939-15	410-3728-3	Smallmouth Bass	Don't Use
OL-3229-04F	OL-F-1A-20-SMB-03	OL-F-1A	410-7904-4	410-3728-7	Smallmouth Bass	Use
OL-3222-10F	OL-F-2A-20-SMB-01	OL-F-2A	410-3939-26	410-3728-3	Smallmouth Bass	Use
OL-3226-05F	OL-F-2A-20-SMB-02	OL-F-2A	410-6500-5	410-3728-5	Smallmouth Bass	Don't Use
OL-3226-06F	OL-F-2A-20-SMB-03	OL-F-2A	410-6500-6	410-3728-5	Smallmouth Bass	Don't Use
OL-3222-15F	OL-F-3A-20-SMB-01	OL-F-3A	410-3939-32	410-3728-4	Smallmouth Bass	Use
OL-3226-02F	OL-F-3A-20-SMB-02	OL-F-3A	410-6500-2	410-3728-3	Smallmouth Bass	Use
OL-3228-01F	OL-F-3A-20-SMB-03	OL-F-3A	410-6755-1	410-3728-7	Smallmouth Bass	Use
OL-3228-02F[1]	OL-F-3A-20-SMB-04	OL-F-3A	410-6755-2	410-3728-6	Smallmouth Bass	Use
OL-3222-03F	OL-F-4A-20-SMB-01	OL-F-4A	410-3939-19	410-3728-3	Smallmouth Bass	Don't Use
OL-3223-05F	OL-F-4A-20-SMB-02	OL-F-4A	410-3939-6	410-3728-4	Smallmouth Bass	Use
OL-3223-06F	OL-F-4A-20-SMB-03	OL-F-4A	410-3939-7	410-3728-3	Smallmouth Bass	Don't Use
OL-3220-13F	OL-F-5A-20-SMB-01	OL-F-5A	410-3728-14	410-3728-5	Smallmouth Bass	Don't Use
OL-3222-01F[1]	OL-F-5A-20-SMB-02	OL-F-5A	410-3939-17	410-3728-6	Smallmouth Bass	Use
OL-3223-08F	OL-F-5A-20-SMB-03	OL-F-5A	410-3939-9	410-3728-7	Smallmouth Bass	Use
OL-3223-09F	OL-F-5A-20-SMB-04	OL-F-5A	410-3939-10	410-3728-3	Smallmouth Bass	Don't Use
OL-3222-07F	OL-F-5B-20-SMB-01	OL-F-5B	410-3939-23	410-3728-3	Smallmouth Bass	Don't Use
OL-3228-03F	OL-F-5B-20-SMB-02	OL-F-5B	410-6755-3	410-3728-4	Smallmouth Bass	Don't Use
OL-3228-04F	OL-F-5B-20-SMB-03	OL-F-5B	410-6755-4	410-3728-4	Smallmouth Bass	Don't Use
OL-3228-05F	OL-F-6A-20-SMB-01	OL-F-6A	410-6755-5	410-3728-5	Smallmouth Bass	Use
OL-3228-06F	OL-F-6A-20-SMB-02	OL-F-6A	410-6755-6	410-3728-3	Smallmouth Bass	Use
OL-3226-08F	OL-F-7A-20-SMB-01	OL-F-7A	410-6500-9	410-3728-4	Smallmouth Bass	Use
OL-3226-09F	OL-F-7A-20-SMB-02	OL-F-7A	410-6500-10	410-3728-3	Smallmouth Bass	Use
OL-3226-10F	OL-F-7A-20-SMB-03	OL-F-7A	410-6500-11	410-3728-5	Smallmouth Bass	Don't Use

Notes

1. SDG 410-3728-6 was processed during March 2022 lab visit with Parsons oversight. As such, these samples are considered usable and were not evaluated during November 2022 lab visit.

ONONDAGA LAKE 2020 SMALLMOUTH BASS - USE

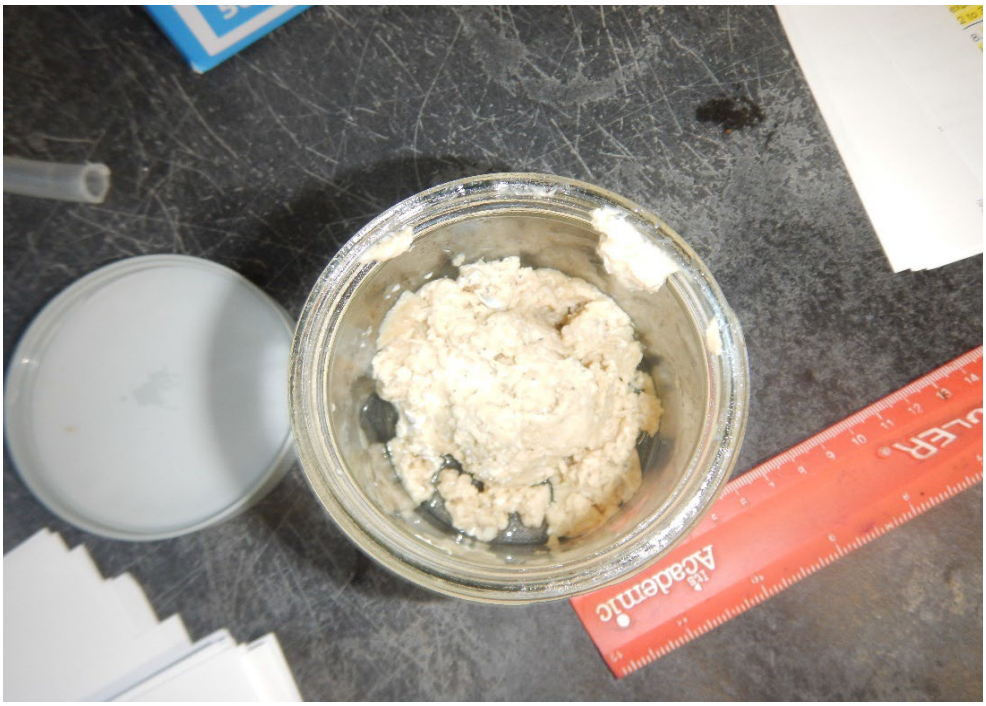


0L-3222-10F (0L-F-2A-20-SMB-01)

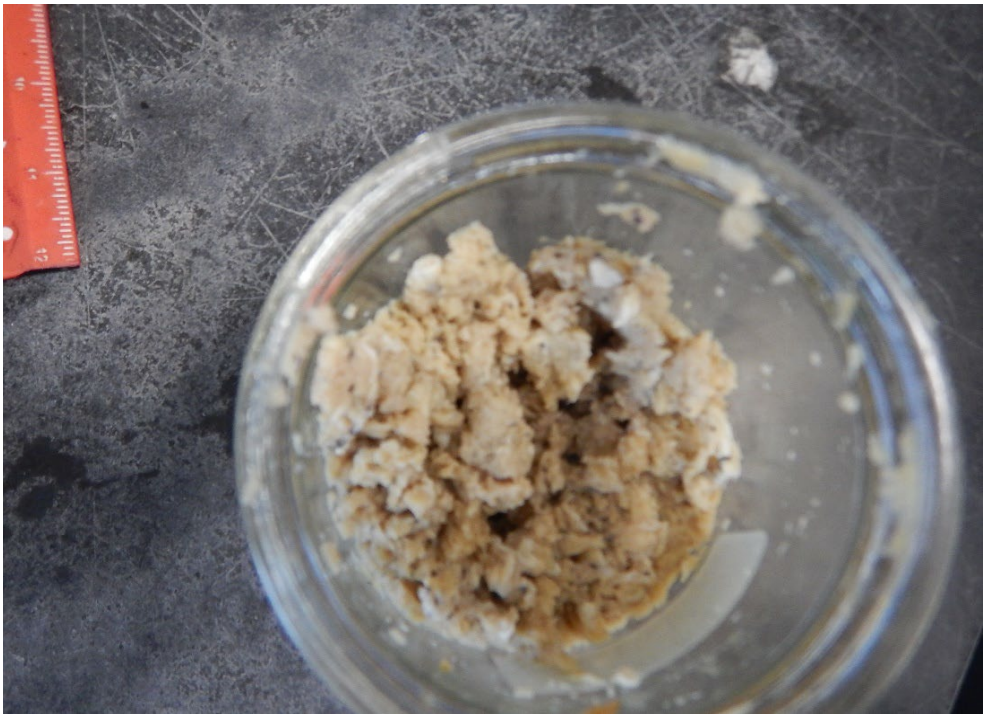


0L-3222-15F (0L-F-3A-20-SMB-01)

ONONDAGA LAKE 2020 SMALLMOUTH BASS - USE



0L-3223-05F (0L-F-4A-20-SMB-02)

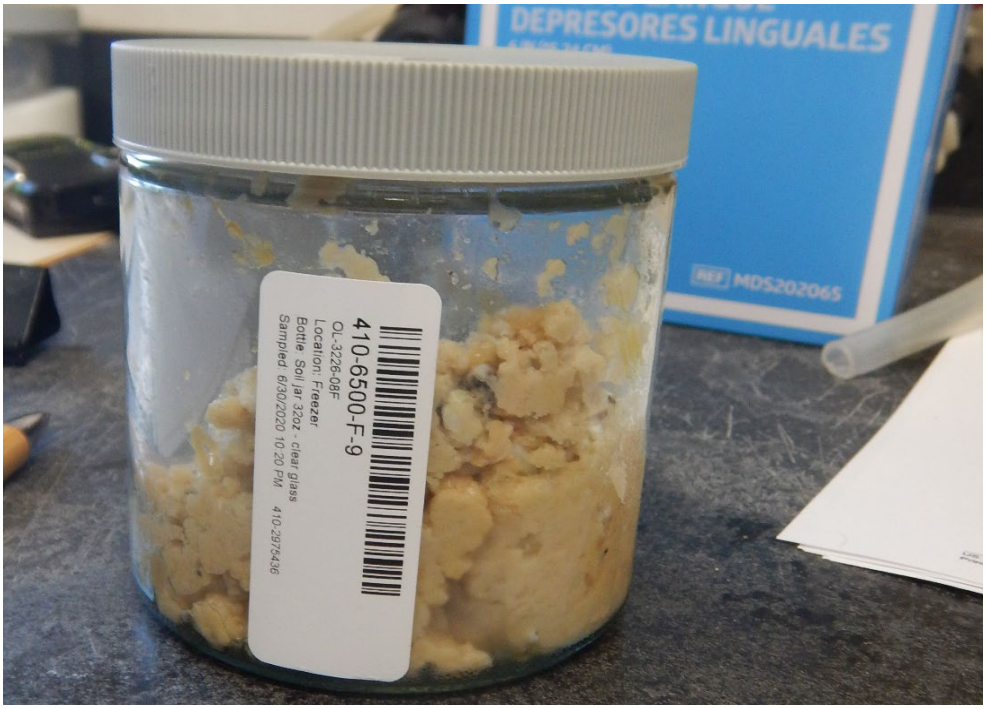


0L-3223-08F (0L-F-5A-20-SMB-03)

ONONDAGA LAKE 2020 SMALLMOUTH BASS - USE

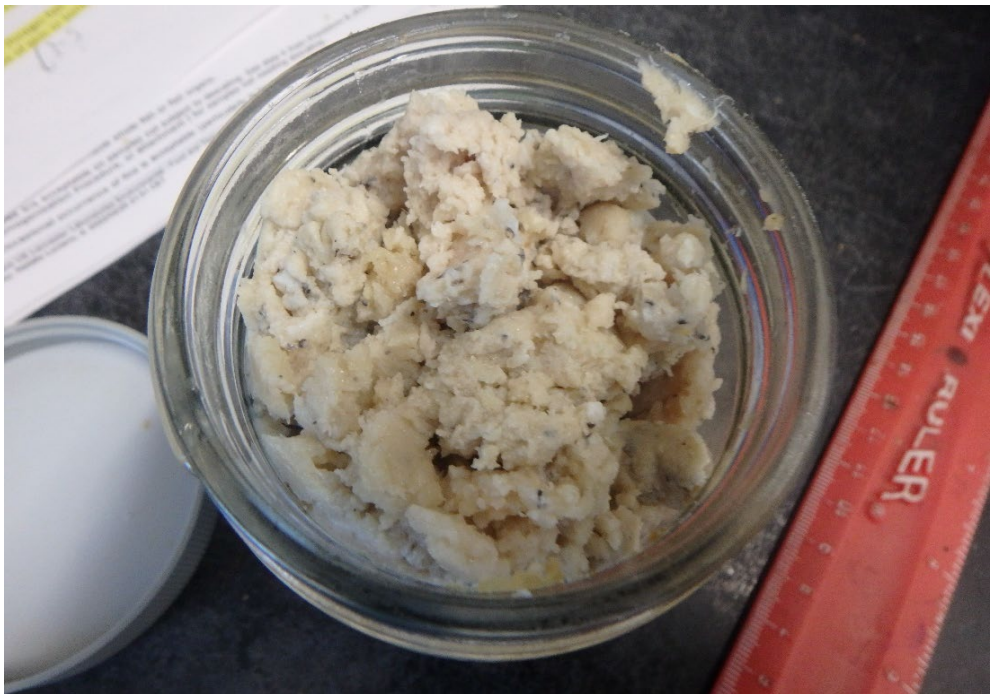


0L-3226-02F (0L-F-3A-20-SMB-02)



0L-3226-08F (0L-F-7A-20-SMB-01)

ONONDAGA LAKE 2020 SMALLMOUTH BASS - USE



0L-3226-09F (0L-F-7A-20-SMB-02)



0L-3228-01F (0L-F-3A-20-SMB-03)

ONONDAGA LAKE 2020 SMALLMOUTH BASS - USE

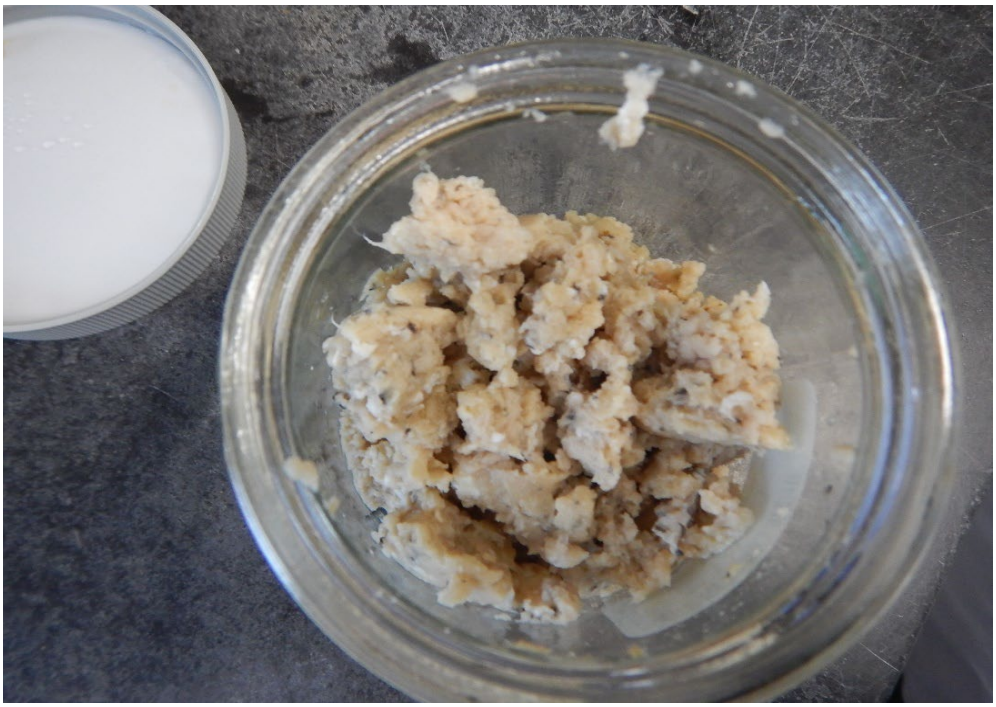


0L-3228-05F (0L-F-6A-20-SMB-01)



0L-3228-06F 0L-F-6A-20-SMB-02

ONONDAGA LAKE 2020 SMALLMOUTH BASS - USE



0L-3229-04F (0L-F-1A-20-SMB-03)

ONONDAGA LAKE 2020 SMALLMOUTH BASS – DO NOT USE



0L-3220-13F (0L-F-5A-20-SMB-01)



0L-3222-03F (0L-F-4A-20-SMB-01)

ONONDAGA LAKE 2020 SMALLMOUTH BASS – DO NOT USE

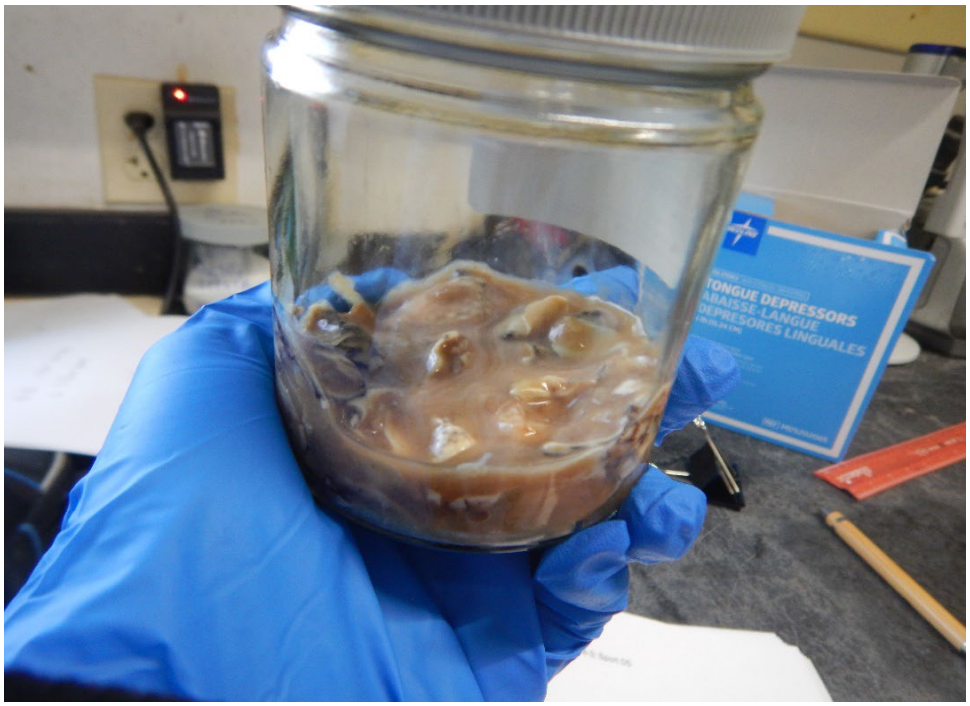


0L-3222-07F (0L-F-5B-20-SMB-01)



0L-3223-06F (0L-F-4A-20-SMB-03)

ONONDAGA LAKE 2020 SMALLMOUTH BASS – DO NOT USE



0L-3223-09F (0L-F-5A-20-SMB-04)



0L-3223-13F (0L-F-1A-20-SMB-01)

ONONDAGA LAKE 2020 SMALLMOUTH BASS – DO NOT USE



0L-3223-14F (0L-F-1A-20-SMB-02)



0L-3226-05F (0L-F-2A-20-SMB-02)

ONONDAGA LAKE 2020 SMALLMOUTH BASS – DO NOT USE

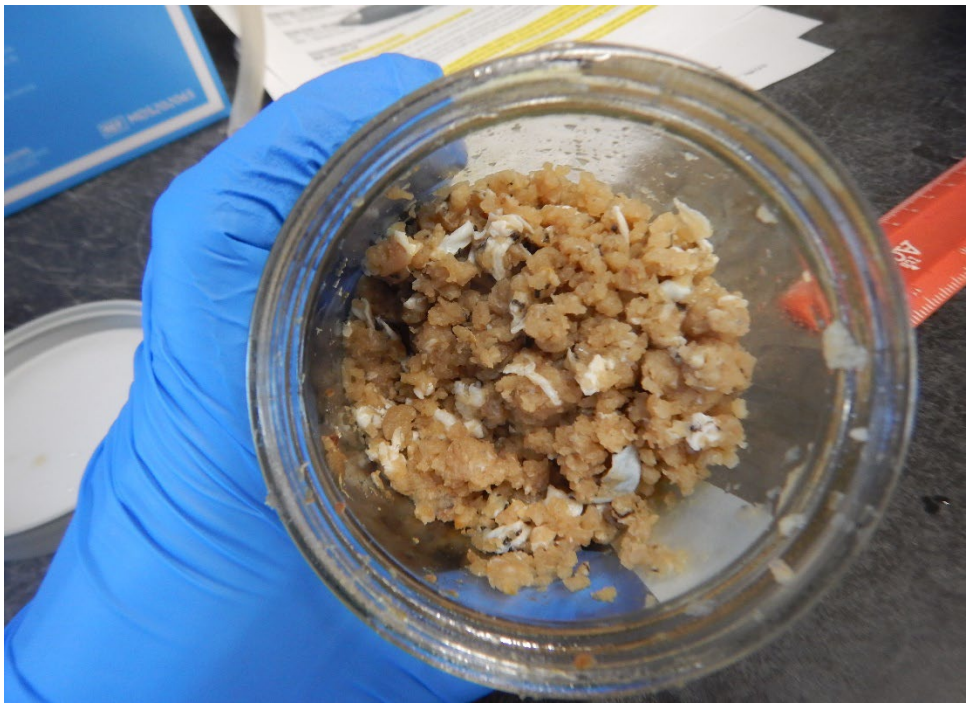


0L-3226-06F (0L-F-2A-20-SMB-03)



0L-3226-10F (0L-F-7A-20-SMB-03)

ONONDAGA LAKE 2020 SMALLMOUTH BASS – DO NOT USE



0L-3228-03F (0L-F-5B-20-SMB-02)



0L-3228-04F (0L-F-5B-20-SMB-03)

ATTACHMENT 1E - ONONDAGA LAKE 2020 COMMON CARP USABILITY TABLE AND PHOTOLOG

TABLE 1E. SUMMARY OF 2020 ONONDAGA LAKE FISH DATA USABILITY - COMMON CARP

Sample Code	Sample Name	Location ID	Lab Sample ID	Lab SDG	Species	Usability
OL-3223-12F[1]	OL-F-1A-20-CCP-01	OL-F-1A	410-3939-13	410-3728-6	Common Carp	Use
OL-3225-01F	OL-F-1A-20-CCP-02	OL-F-1A	410-4529-1	410-3728-3	Common Carp	Use
OL-3229-05F	OL-F-1A-20-CCP-03	OL-F-1A	410-7904-5	410-3728-4	Common Carp	Don't Use
OL-3226-03F	OL-F-2A-20-CCP-01	OL-F-2A	410-6500-3	410-3728-4	Common Carp	Don't Use
OL-3226-04F	OL-F-2A-20-CCP-02	OL-F-2A	410-6500-4	410-3728-3	Common Carp	Use
OL-3229-06F	OL-F-2A-20-CCP-03	OL-F-2A	410-7904-6	410-3728-7	Common Carp	Use
OL-3222-14F	OL-F-3A-20-CCP-01	OL-F-3A	410-3939-31	410-3728-3	Common Carp	Don't Use
OL-3226-01F	OL-F-3A-20-CCP-02	OL-F-3A	410-6500-1	410-3728-3	Common Carp	Don't Use
OL-3226-07F[1]	OL-F-3A-20-CCP-03	OL-F-3A	410-6500-7	410-3728-6	Common Carp	Use
OL-3222-19F	OL-F-4A-20-CCP-01	OL-F-4A	410-3939-36	410-3728-7	Common Carp	Use
OL-3223-03F	OL-F-4A-20-CCP-02	OL-F-4A	410-3939-4	410-3728-3	Common Carp	Don't Use
OL-3223-04F	OL-F-4A-20-CCP-03	OL-F-4A	410-3939-5	410-3728-5	Common Carp	Don't Use
OL-3220-04F	OL-F-5A-20-CCP-01	OL-F-5A	410-3728-4	410-3728-3	Common Carp	Don't Use
OL-3220-05F	OL-F-5A-20-CCP-02	OL-F-5A	410-3728-6	410-3728-4	Common Carp	Don't Use
OL-3229-01F	OL-F-5A-20-CCP-03	OL-F-5A	410-7904-1	410-3728-4	Common Carp	Don't Use
OL-3236-01F	OL-F-5A-20-CCP-04	OL-F-5A	410-16346-1	410-3728-5	Common Carp	Don't Use
OL-3222-04F	OL-F-5B-20-CCP-01	OL-F-5B	410-3939-20	410-3728-3	Common Carp	Don't Use
OL-3222-05F	OL-F-5B-20-CCP-02	OL-F-5B	410-3939-21	410-3728-5	Common Carp	Don't Use
OL-3222-06F	OL-F-5B-20-CCP-03	OL-F-5B	410-3939-22	410-3728-5	Common Carp	Use
OL-3223-02F	OL-F-5B-20-CCP-04	OL-F-5B	410-3939-2	410-3728-3	Common Carp	Don't Use
OL-3225-02F	OL-F-6A-20-CCP-01	OL-F-6A	410-4529-2	410-3728-4	Common Carp	Don't Use
OL-3225-03F	OL-F-6A-20-CCP-02	OL-F-6A	410-4529-3	410-3728-3	Common Carp	Don't Use
OL-3225-04F	OL-F-6A-20-CCP-03	OL-F-6A	410-4529-4	410-3728-5	Common Carp	Don't Use
OL-3230-04F	OL-F-7A-20-CCP-01	OL-F-7A	410-9225-4	410-3728-7	Common Carp	Don't Use
OL-3236-03F	OL-F-7A-20-CCP-02	OL-F-7A	410-16346-3	410-3728-3	Common Carp	Use

Notes

1. SDG 410-3728-6 was processed during March 2022 lab visit with Parsons oversight. As such, these samples are considered usable and were not evaluated during November 2022 lab visit.

ONONDAGA LAKE 2020 COMMON CARP - USE

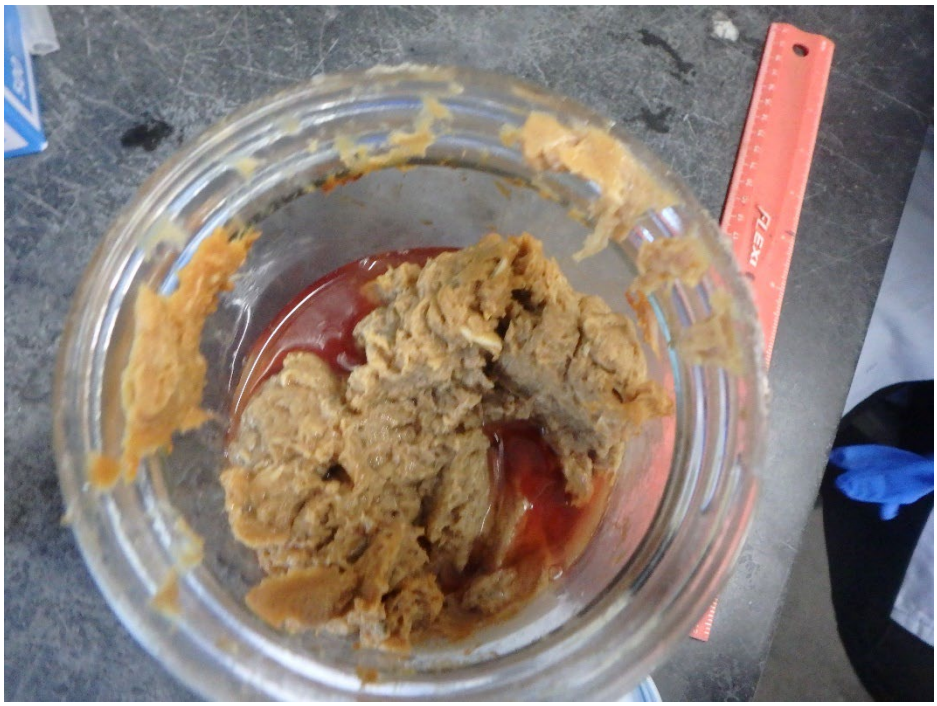


0L-3222-06F (0L-F-5B-20-CCP-03)



0L-3222-19F (0L-F-4A-20-CCP-01)

ONONDAGA LAKE 2020 COMMON CARP - USE

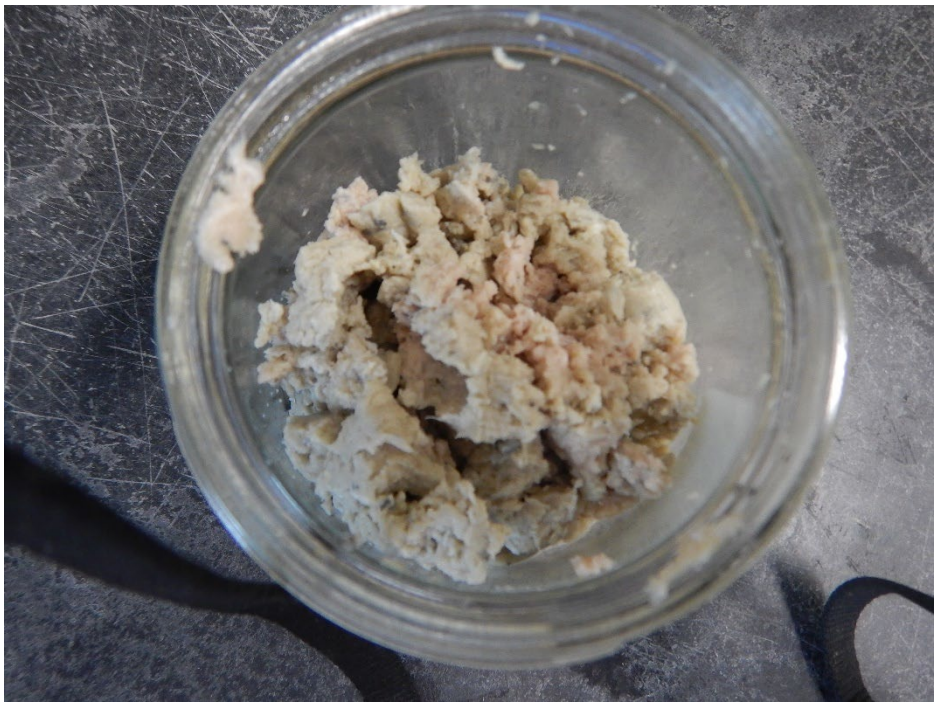


0L-3225-01F (0L-F-1A-20-CCP-02)



0L-3226-04F (0L-F-2A-20-CCP-02)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



0L-3229-06F (0L-F-2A-20-CCP-03)



0L-3236-03F (0L-F-7A-20-CCP-02)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



0L-3220-04F (0L-F-5A-20-CCP-01)



0L-3220-05F (0L-F-5A-20-CCP-02)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



0L-3222-04F (0L-F-5B-20-CCP-01)



0L-3222-14F (0L-F-3A-20-CCP-01)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



0L-3223-02F (0L-F-5B-20-CCP-04)



0L-3223-03F (0L-F-4A-20-CCP-02)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



0L-3223-04F (0L-F-4A-20-CCP-03)



0L-3225-02F (0L-F-6A-20-CCP-01)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



0L-3225-03F (0L-F-6A-20-CCP-02)



0L-3225-04F (0L-F-6A-20-CCP-03)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE

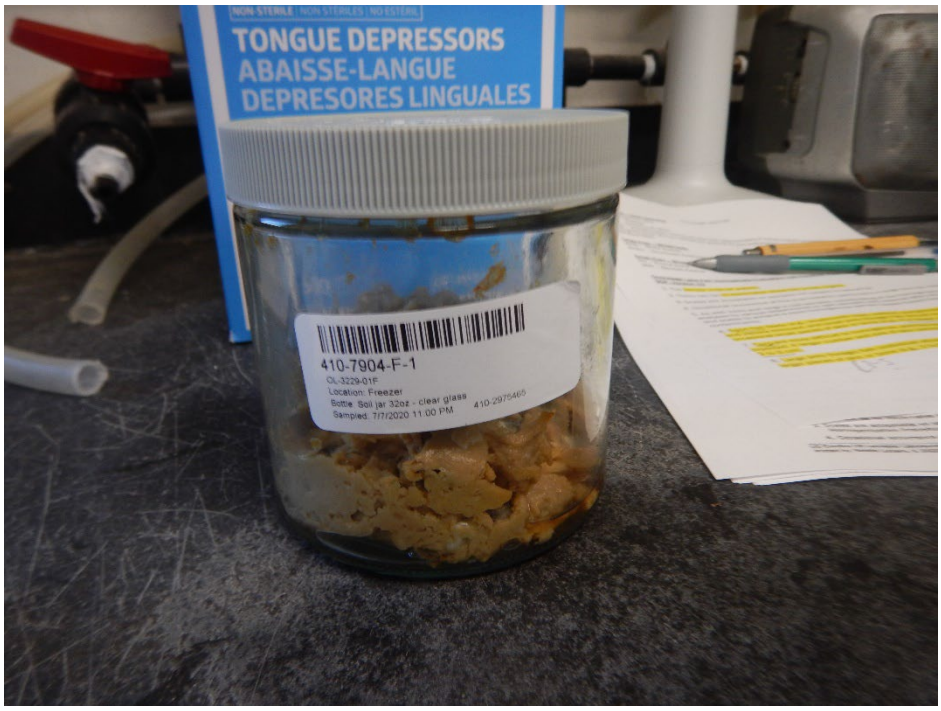


0L-3226-01F (0L-F-3A-20-CCP-02)



0L-3226-03F (0L-F-2A-20-CCP-01)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



OL-3229-01F (OL-F-5A-20-CCP-03)



OL-3229-05F (OL-F-1A-20-CCP-03)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



OL-3230-04F (OL-F-7A-20-CCP-01)



OL-3236-01F (OL-F-5A-20-CCP-04)

ONONDAGA LAKE 2020 COMMON CARP – DO NOT USE



0L-3222-05F (0L-F-5B-20-CCP-02)

ATTACHMENT 1F - ONONDAGA LAKE 2020 PUMPKINSEED USABILITY TABLE AND PHOTOLOG

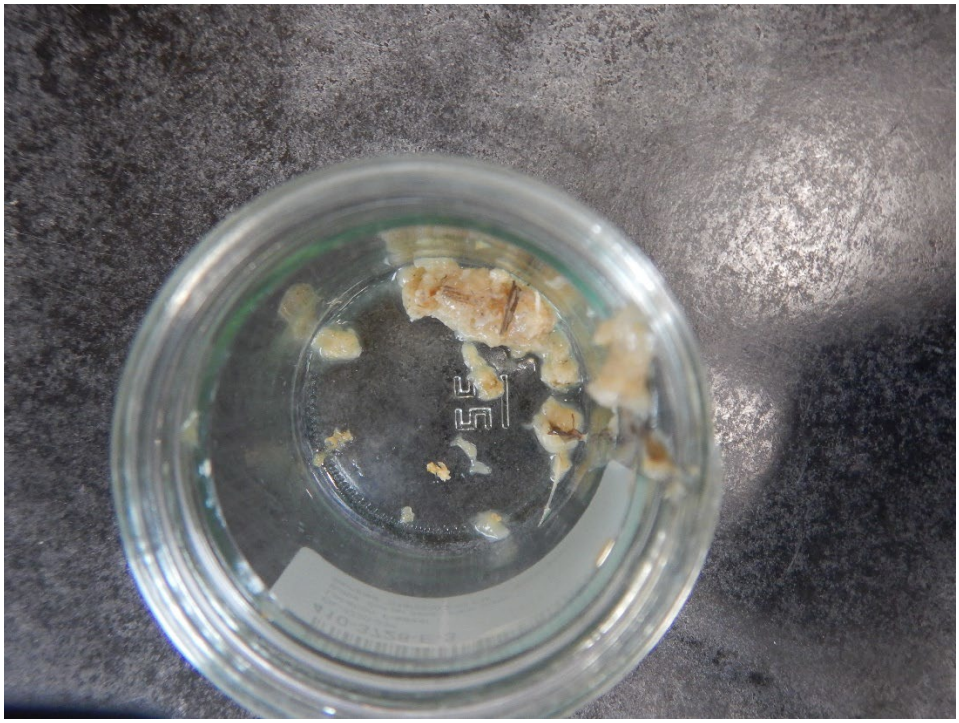
TABLE 1F. SUMMARY OF 2020 ONONDAGA LAKE FISH DATA USABILITY - PUMPKINSEED

Sample Code	Sample Name	Location ID	Lab Sample ID	Lab SDG	Species	Usability
OL-3220-01F	OL-F-1A-20-PKSD-01	OL-F-1A	410-3728-1	410-3728-2	Pumpkinseed	Don't Use
OL-3220-02F	OL-F-1A-20-PKSD-02	OL-F-1A	410-3728-2	410-3728-2	Pumpkinseed	Don't Use
OL-3220-03F	OL-F-1A-20-PKSD-03	OL-F-1A	410-3728-3	410-3728-2	Pumpkinseed	Use
OL-3236-02F[1]	OL-F-2A-20-PKSD-01	OL-F-2A	410-16346-2	410-3728-7	Pumpkinseed	Don't Use
OL-3238-03F[1]	OL-F-2A-20-PKSD-02	OL-F-2A	410-19110-3	410-3728-7	Pumpkinseed	Don't Use
OL-3238-04F[2]	OL-F-2A-20-PKSD-03	OL-F-2A	410-19110-4	410-3728-6	Pumpkinseed	Use
OL-3233-01F	OL-F-3A-20-PKSD-01	OL-F-3A	410-10902-1	410-3728-5	Pumpkinseed	Use
OL-3236-04F	OL-F-3A-20-PKSD-02	OL-F-3A	410-16346-4	410-3728-2	Pumpkinseed	Use
OL-3238-05F[2]	OL-F-3A-20-PKSD-03	OL-F-3A	410-19110-5	410-3728-6	Pumpkinseed	Use
OL-3230-01F[1]	OL-F-4A-20-PKSD-01	OL-F-4A	410-9225-1	410-3728-7	Pumpkinseed	Don't Use
OL-3230-02F[1]	OL-F-4A-20-PKSD-02	OL-F-4A	410-9225-2	410-3728-2	Pumpkinseed	Don't Use
OL-3230-03F	OL-F-4A-20-PKSD-03	OL-F-4A	410-9225-3	410-3728-2	Pumpkinseed	Use
OL-3224-01F	OL-F-5A-20-PKSD-01	OL-F-5A	410-4044-1	410-3728-5	Pumpkinseed	Use
OL-3224-02F	OL-F-5A-20-PKSD-02	OL-F-5A	410-4044-2	410-3728-4	Pumpkinseed	Use
OL-3224-03F	OL-F-5A-20-PKSD-03	OL-F-5A	410-4044-3	410-3728-2	Pumpkinseed	Use
OL-3224-04F	OL-F-5A-20-PKSD-04	OL-F-5A	410-4044-4	410-3728-5	Pumpkinseed	Use
OL-3238-01F	OL-F-5A-20-PKSD-05	OL-F-5A	410-19110-1	410-3728-5	Pumpkinseed	Use
OL-3238-02F	OL-F-5A-20-PKSD-06	OL-F-5A	410-19110-2	410-3728-4	Pumpkinseed	Use
OL-3220-17F	OL-F-5B-20-PKSD-01	OL-F-5B	410-3728-18	410-3728-4	Pumpkinseed	Use
OL-3223-11F[3]	OL-F-5B-20-PKSD-02	OL-F-5B	410-3939-12	410-3728-2	Pumpkinseed	Use
OL-3230-05F[3]	OL-F-5B-20-PKSD-03	OL-F-5B	410-9225-5	410-3728-4	Pumpkinseed	Use
OL-3220-07F	OL-F-6A-20-PKSD-01	OL-F-6A	410-3728-8	410-3728-4	Pumpkinseed	Use
OL-3223-10F	OL-F-7A-20-PKSD-01	OL-F-7A	410-3939-11	410-3728-5	Pumpkinseed	Use
OL-3229-02F	OL-F-7A-20-PKSD-02	OL-F-7A	410-7904-2	410-3728-2	Pumpkinseed	Use
OL-3229-03F	OL-F-7A-20-PKSD-03	OL-F-7A	410-7904-3	410-3728-2	Pumpkinseed	Use

Notes

1. Four Pumpkinseed samples (OL-3236-02F, OL-3238-03F, OL-3230-01F, OL-3230-02F) had no remaining mass or only very little residual remaining mass (<1 gram) and were not able to be reviewed during November 2022 lab visit. Therefore, these were conservatively assumed to be improperly homogenized.
2. SDG 410-3728-6 was processed during March 2022 lab visit with Parsons oversight. As such, these samples are considered usable and were not evaluated during November 2022 lab visit.
3. Entire remainder of sample transferred for split samples during October 2022 video conference and therefore not reviewed during November 2022 lab visit.

ONONDAGA LAKE 2020 PUMPKINSEED - USE

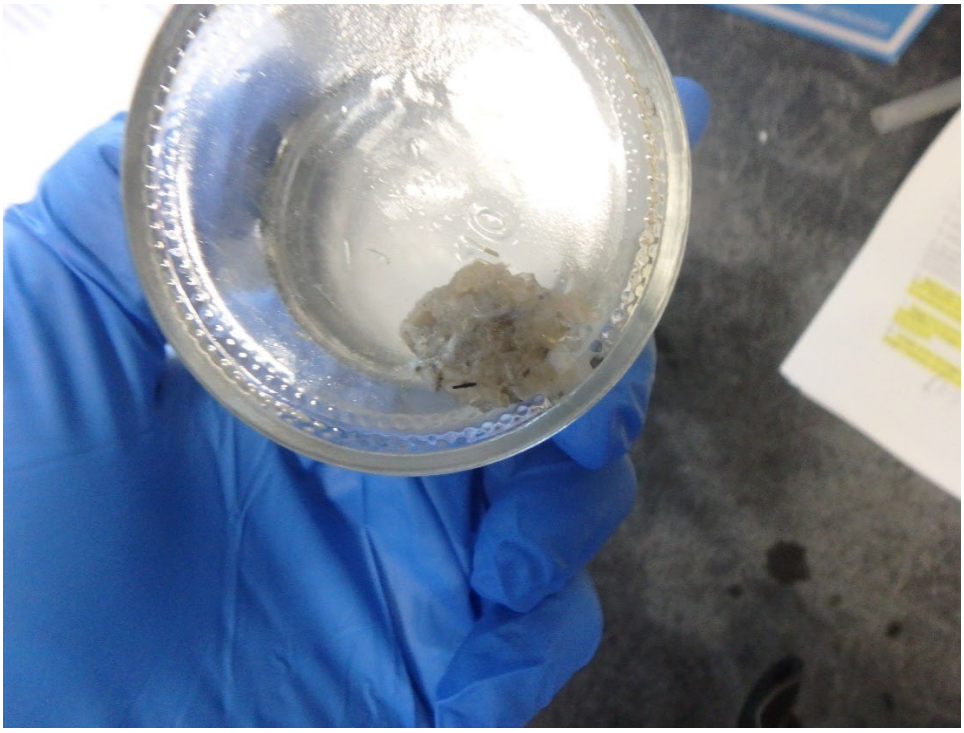


0L-3220-03F (0L-F-1A-20-PKSD-03)

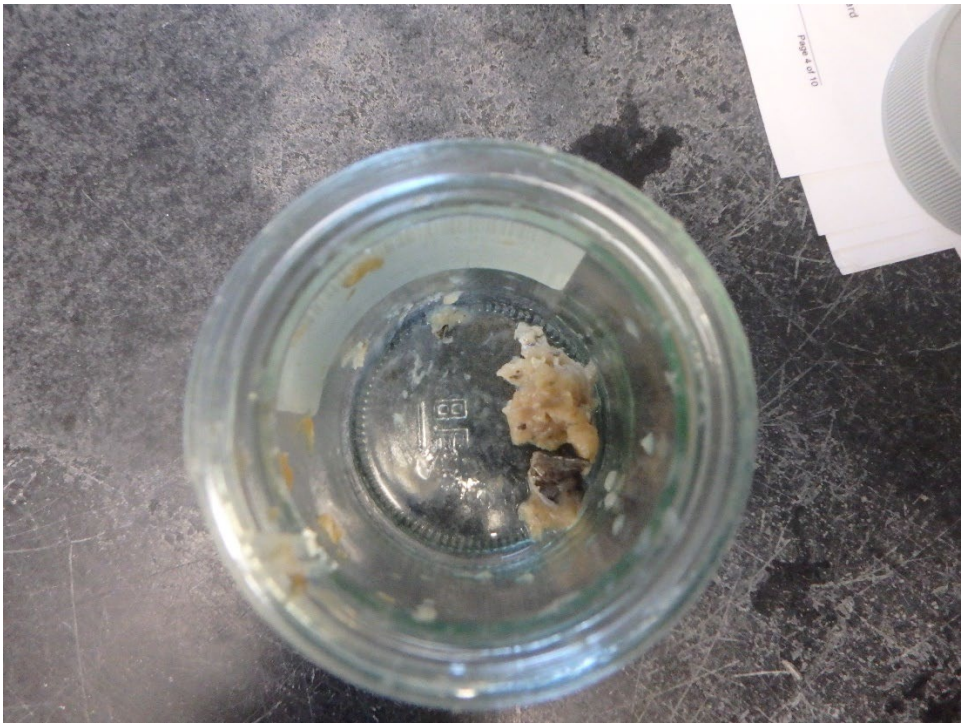


0L-3220-07F (0L-F-6A-20-PKSD-01)

ONONDAGA LAKE 2020 PUMPKINSEED - USE

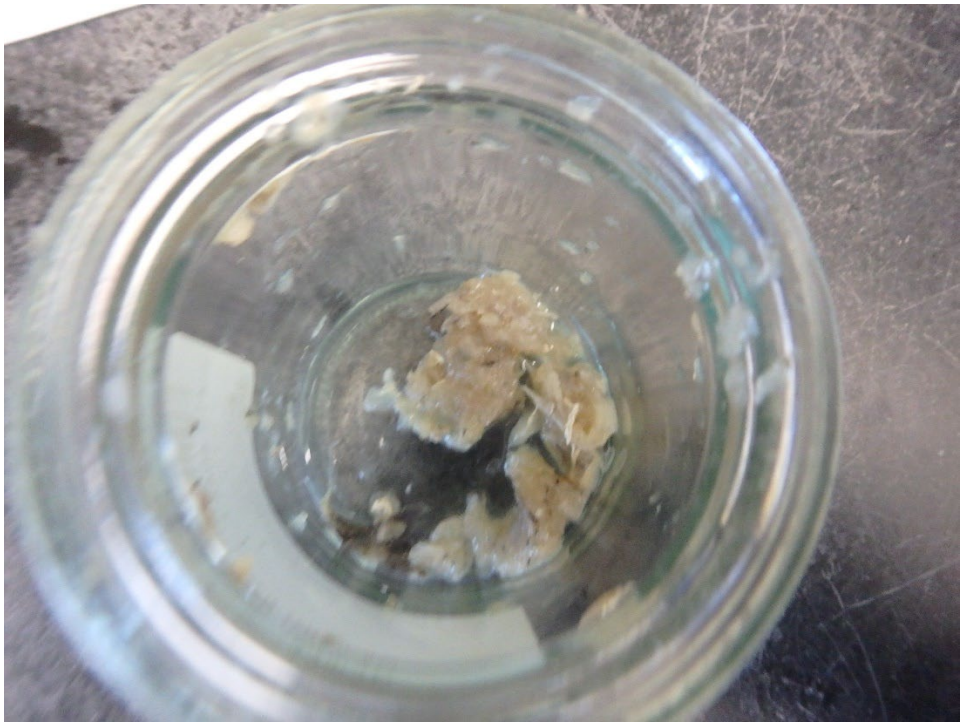


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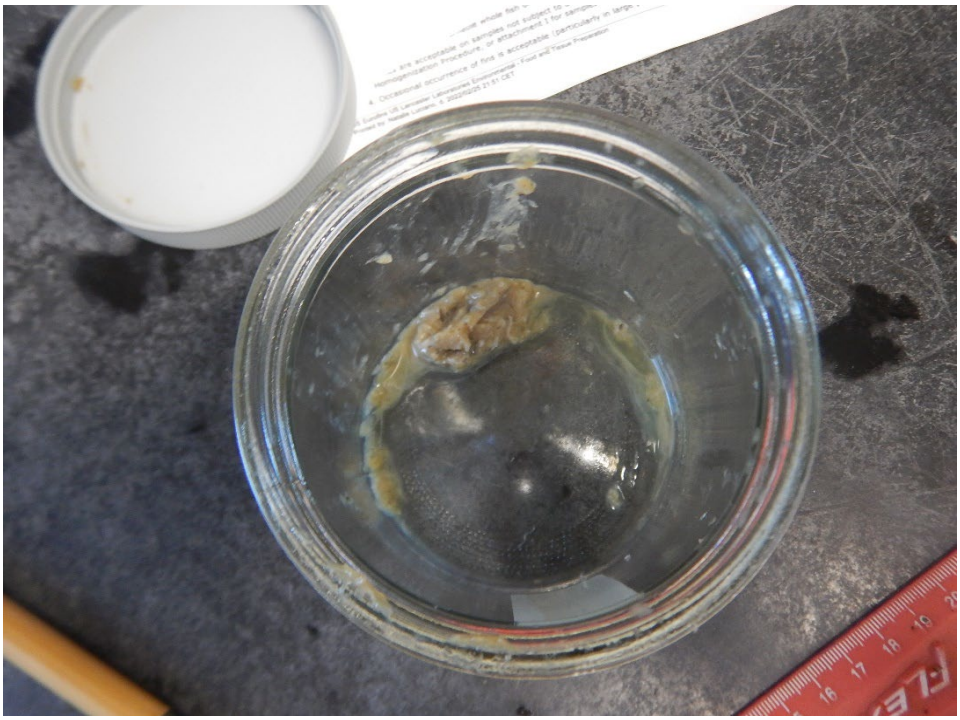


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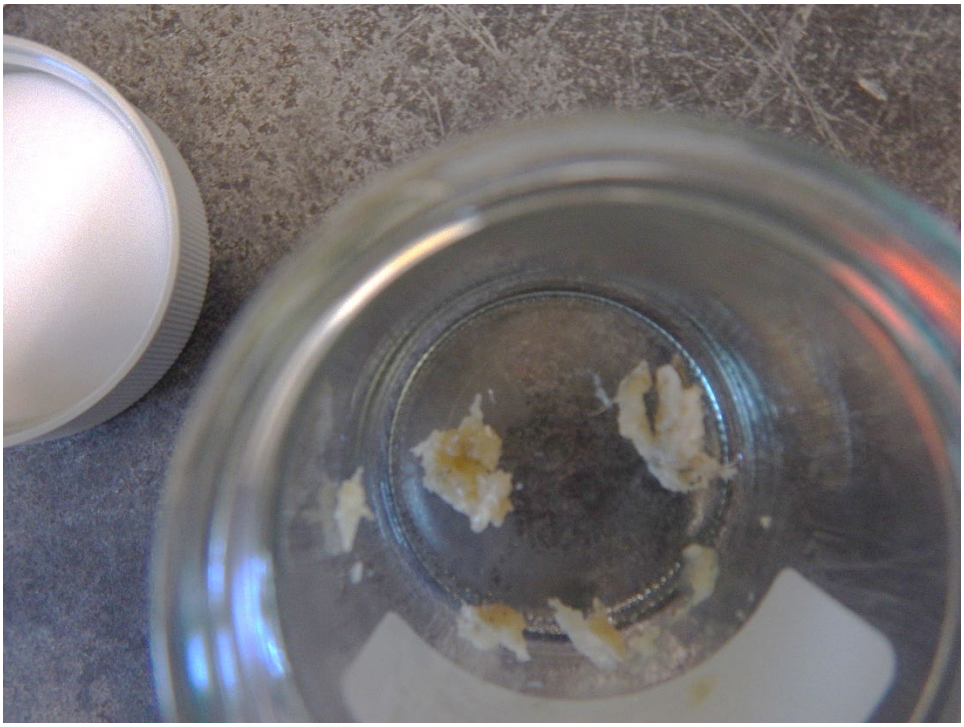


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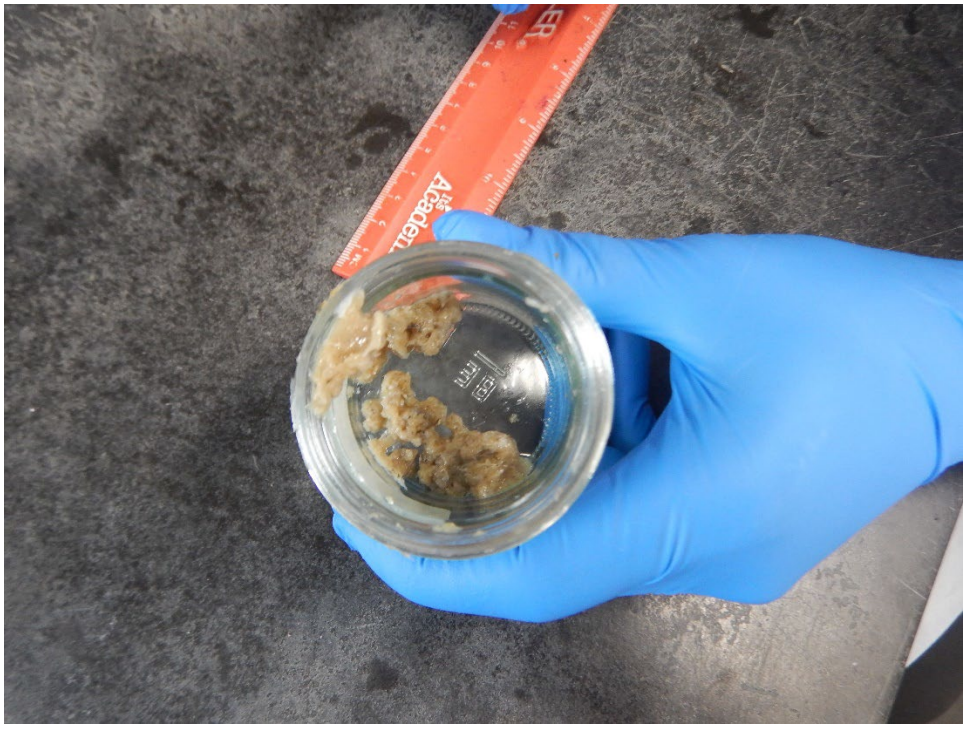


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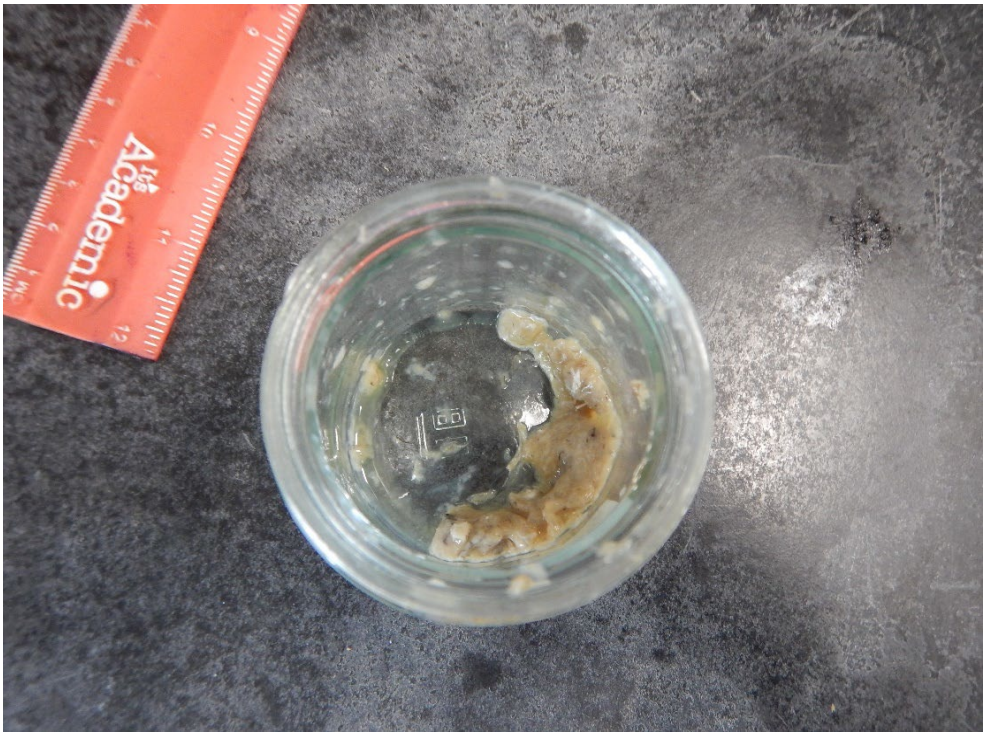


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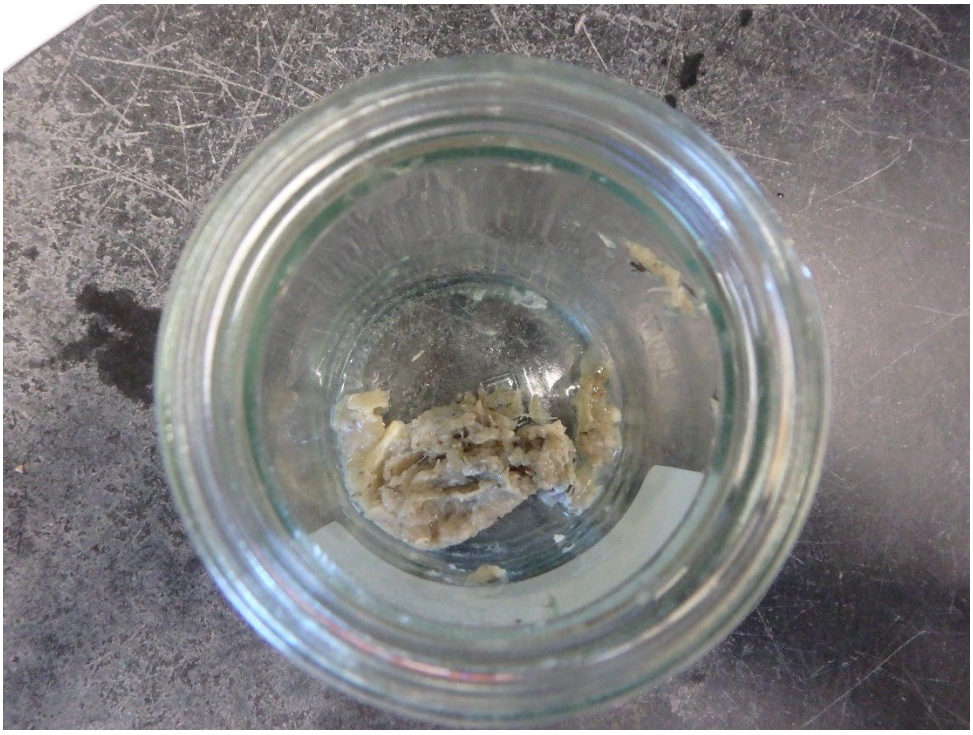


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0L-3230-03F (0L-F-4A-20-PKSD-03)

ONONDAGA LAKE 2020 PUMPKINSEED - USE



OL-3233-01F (OL-F-3A-20-PKSD-01)



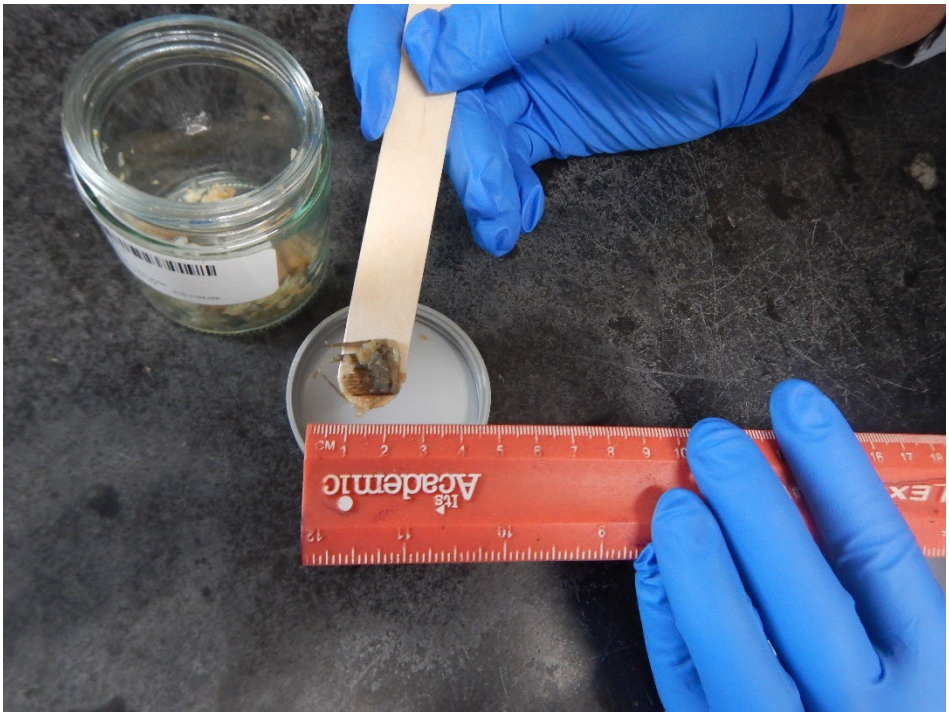
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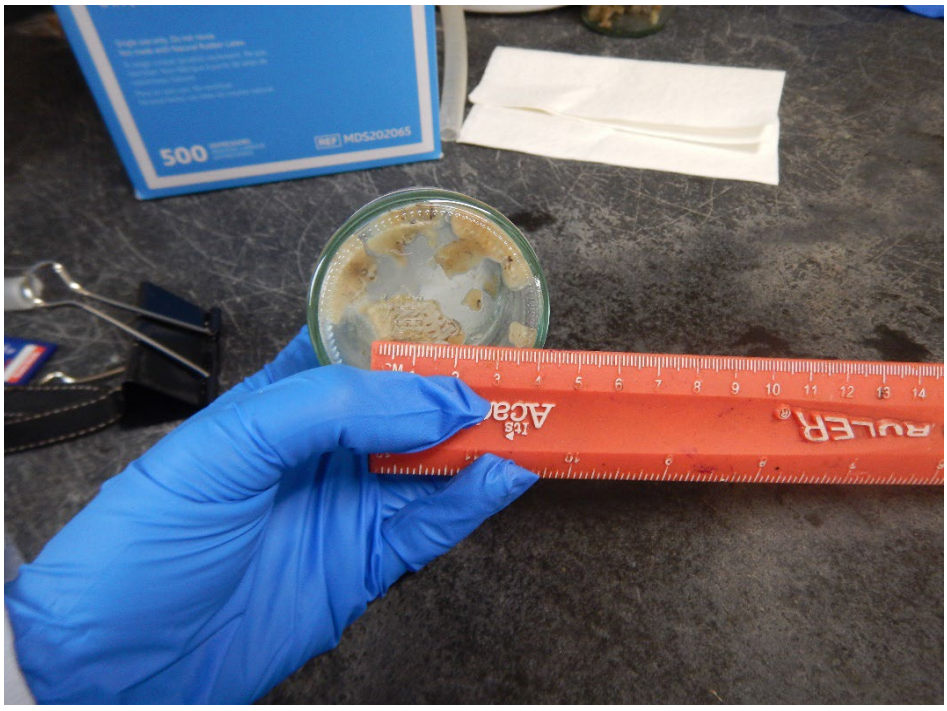


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0L-3220-01F (0L-F-1A-20-PKSD-01)



0L-3220-02F (0L-F-1A-20-PKSD-02)

APPENDIX 4A - DATA USABILITY AND SUMMARY REPORT ONONDAGA LAKE 2020 MONITORED NATURAL RECOVERY

APPENDIX 4A:

DATA USABILITY SUMMARY REPORT

2020 MONITORED NATURAL RECOVERY
ONONDAGA LAKE
ONONDAGA COUNTY, NEW YORK

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JUNE 2021

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LIST OF ATTACHMENTS

ATTACHMENT A – VALIDATED LABORATORY DATA

SECTION 4A1 DATA USABILITY SUMMARY

Sediment trap samples were collected as part of the Monitored Natural Recovery efforts at Onondaga Lake from May 12, 2020 through November 18, 2020. Analytical results from these samples were validated and reviewed by Parsons for usability with respect to the following requirements:

- Onondaga Lake Natural Recovery Monitoring Work Plan for 2020 (Parsons and Anchor QEA 2020);
- Quality Assurance Project Plan (QAPP) for Onondaga Lake Construction and Post-Construction Media Monitoring (Surface Water, Biota and Sediment) (Parsons. Anchor QEA and Upstate Freshwater Institute [UFI] 2020); and
- USEPA Region II Standard Operating Procedures (SOPs) for inorganic data review.

The analytical laboratories for this project were Eurofins – Frontier and Upstate Freshwater Institute (UFI). These laboratories are certified by the State of New York to conduct laboratory analyses for this project through the National Environmental Laboratory Accreditation Conference (NELAC) and the New State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP).

4A1.1 Laboratory Data Packages

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 6 to 31 days for the samples.

The data packages received from the laboratories were paginated, complete, and overall were of good quality. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report which is summarized by sample media in Section 4A2.

4A1.2 Sampling and Chain-of-Custody

The samples were collected, properly preserved, shipped under a chain-of-custody (COC) record, and received at the laboratories within one day of sampling. All samples were received intact and in good condition at the laboratories.

4A1.3 Laboratory Analytical Methods

The sediment trap samples were collected from the site and analyzed for low level mercury, total suspended solids (TSS), and total fixed solids (TFS). Summaries of deviations from the Work Plan, QAPP, or USEPA Region II SOPs concerning these laboratory analyses are presented in Subsections 4A1.3.1 through 4A1.3.2. The data qualifications resulting from the data validation review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are discussed for each analytical method by media in Section 4A2. The laboratory data were reviewed and may be qualified with the following validation flags:

"U" - not detected at the value given
"UJ" - estimated and not detected at the value given
"J" - estimated at the value given

"J+" - estimated biased high at the value given
"J-" - estimated biased low at the value given
"N" - presumptive evidence at the value given
"R" - unusable value

The validated laboratory data were tabulated and are presented in Attachment A.

4A1.3.1 Mercury Analysis

Sediment trap samples were analyzed for low level mercury using the USEPA 1631E analytical method. Certain reported results for the mercury samples were qualified as not detected based upon blank contamination. The reported mercury analytical results were considered 100% complete (i.e., usable) for the data presented by Eurofins. PARCCS requirements were met.

4A1.3.2 Other Sediment Trap Analyses

Sediment trap samples were also analyzed TSS and TFS using the SM2540D and SM2540E analytical methods, respectively. The reported results for these samples did not require qualification resulting from data validation. The reported analytical results for these parameters were considered 100% complete (i.e., usable) for the data presented by UFI. PARCCS requirements were met.

SECTION 4A2 DATA VALIDATION REPORT

4A2.1 Sediment Trap Samples

Data review has been completed for data packages generated by Eurofins and UFI containing results for sediment trap samples collected from the site. The specific samples contained in these data packages, the analyses performed, and the validated laboratory data were tabulated and are presented in Attachment A. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory.

Data validation was performed for all samples in accordance with the project work plan and QAPP as well as the USEPA Region II SOP HW-2c, Revision 15 "Mercury and Cyanide Data Validation". This data validation and usability report is presented by analysis type.

4A2.1.1 Low Level Mercury

The following items were reviewed for compliancy in the low level mercury analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration verifications
- Initial and continuing calibration, and laboratory preparation blank contamination
- Matrix spike / matrix spike duplicate (MS/MSD) recoveries
- Laboratory duplicate precision
- Laboratory control sample (LCS) recoveries
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination as discussed below.

Blank Contamination

The laboratory continuing calibration blanks associated with the project samples contained low level mercury at a concentration range of 0.04-0.32 ng/L; the laboratory initial calibration blanks associated with the project samples contained low level mercury at a concentration range of 0.09-0.16 ng/L; and the laboratory preparation blanks associated with the project samples collected on 5/12/20 through 9/1/20 contained low level mercury at a concentration range of 0.24-0.34 µg/L. Therefore, results for this analyte less than validation action concentrations were considered not detected and qualified "U" for the affected samples.

Usability

All low level mercury results for the sediment trap samples were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The low level mercury data presented by Eurofins were 100% complete (i.e., usable). The validated low level mercury laboratory data are tabulated and presented in Attachment A.

4A2.1.2 TSS and TFS

All custody documentation, holding times, matrix spike recoveries, laboratory duplicate precision, laboratory control sample recoveries, laboratory method blank contamination, initial and continuing calibration verifications, field duplicate precision, and quantitation limits were reviewed for compliance. Validation qualification of the sample results for these parameters was not required. The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The data for these parameters presented by UFI were 100% complete (i.e., usable). The validated laboratory data are tabulated and presented in Attachment A.

ATTACHMENT A – VALIDATED LABORATORY DATA

Onondaga Lake
2020 Sediment trap samples

								Parameter	MERCURY		TOTAL FIXED SOLIDS	
								Method	E1631		SM2540E	
								Units	ug/l		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type					
DEEP_S	OL-3548-01	33 - 33	05/12/2020	0I00031	Liquid	REG	SLURRY	0.66				
DEEP_S	OL-3548-02	33 - 33	05/26/2020	0I00031	Liquid	REG	SLURRY	0.5	U			
DEEP_S	OL-3548-03	33 - 33	06/08/2020	0I00031	Liquid	REG	SLURRY	0.26	J			
DEEP_S	OL-3548-04	33 - 33	06/22/2020	0I00031	Liquid	REG	SLURRY	0.5	U			
DEEP_S	OL-3548-05	33 - 33	07/06/2020	0I00031	Liquid	REG	SLURRY	0.5	U			
DEEP_S	OL-3548-06	33 - 33	07/21/2020	0I00031	Liquid	REG	SLURRY	0.5	U			
DEEP_S	OL-3548-07	33 - 33	08/04/2020	0I00031	Liquid	REG	SLURRY	0.26	J			
DEEP_S	OL-3548-08	33 - 33	08/18/2020	0I00031	Liquid	REG	SLURRY	0.5	U			
DEEP_S	OL-3548-09	33 - 33	08/26/2020	0I00031	Liquid	REG	SLURRY	0.38	J			
DEEP_S	OL-3548-10	33 - 33	09/01/2020	0I00031	Liquid	REG	SLURRY	0.49	J			
DEEP_S	OL-3589-01	33 - 33	09/09/2020	0L00015	Liquid	REG	SLURRY	0.59				
DEEP_S	OL-3589-02	33 - 33	09/15/2020	0L00015	Liquid	REG	SLURRY	0.32	J			
DEEP_S	OL-3589-03	33 - 33	09/22/2020	0L00015	Liquid	REG	SLURRY	0.52				
DEEP_S	OL-3589-04	33 - 33	09/29/2020	0L00015	Liquid	REG	SLURRY	0.5	J			
DEEP_S	OL-3589-05	33 - 33	10/06/2020	0L00015	Liquid	REG	SLURRY	0.58				
DEEP_S	OL-3589-06	33 - 33	10/13/2020	0L00015	Liquid	REG	SLURRY	0.8				
DEEP_S	OL-3589-07	33 - 33	10/20/2020	0L00015	Liquid	REG	SLURRY	0.61				
DEEP_S	OL-3589-08	33 - 33	10/27/2020	0L00015	Liquid	REG	SLURRY	0.78				
DEEP_S	OL-3589-09	33 - 33	11/04/2020	0L00015	Liquid	REG	SLURRY	1.39				
DEEP_S	OL-3589-10	33 - 33	11/18/2020	0L00015	Liquid	REG	SLURRY	5.6				
DEEP_S	OL-3501-01	33 - 33	05/12/2020	UFI CHM 2020-021	Liquid	REG	SLURRY			6584		
DEEP_S	OL-3501-02	33 - 33	05/12/2020	UFI CHM 2020-021	Liquid	FD	SLURRY			7112		
DEEP_S	OL-3501-03	33 - 33	05/12/2020	UFI CHM 2020-021	Liquid	FD2	SLURRY			5428		
DEEP_S	OL-3504-01	33 - 33	05/20/2020	UFI CHM 2020-040	Liquid	REG	SLURRY			2164		
DEEP_S	OL-3504-02	33 - 33	05/20/2020	UFI CHM 2020-040	Liquid	FD	SLURRY			2104		
DEEP_S	OL-3504-03	33 - 33	05/20/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY			2660		
DEEP_S	OL-3505-01	33 - 33	05/26/2020	UFI CHM 2020-040	Liquid	REG	SLURRY			1952		
DEEP_S	OL-3505-02	33 - 33	05/26/2020	UFI CHM 2020-040	Liquid	FD	SLURRY			1688		
DEEP_S	OL-3505-03	33 - 33	05/26/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY			1436		
DEEP_S	OL-3506-01	33 - 33	06/01/2020	UFI CHM 2020-040	Liquid	REG	SLURRY			2304		
DEEP_S	OL-3506-02	33 - 33	06/01/2020	UFI CHM 2020-040	Liquid	FD	SLURRY			2104		
DEEP_S	OL-3506-03	33 - 33	06/01/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY			1944		
DEEP_S	OL-3507-01	33 - 33	06/08/2020	UFI CHM 2020-040	Liquid	REG	SLURRY			2828		
DEEP_S	OL-3507-02	33 - 33	06/08/2020	UFI CHM 2020-040	Liquid	FD	SLURRY			2884		
DEEP_S	OL-3507-03	33 - 33	06/08/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY			2920		
DEEP_S	OL-3509-01	33 - 33	06/16/2020	UFI CHM 2020-040	Liquid	REG	SLURRY			2620		
DEEP_S	OL-3509-02	33 - 33	06/16/2020	UFI CHM 2020-040	Liquid	FD	SLURRY			2856		
DEEP_S	OL-3509-03	33 - 33	06/16/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY			2136		
DEEP_S	OL-3512-01	33 - 33	06/22/2020	UFI CHM 2020-040	Liquid	REG	SLURRY			2140		
DEEP_S	OL-3512-02	33 - 33	06/22/2020	UFI CHM 2020-040	Liquid	FD	SLURRY			1496		
DEEP_S	OL-3512-03	33 - 33	06/22/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY			1572		
DEEP_S	OL-3514-01	33 - 33	06/30/2020	UFI CHM 2020-040	Liquid	REG	SLURRY			900		
DEEP_S	OL-3514-02	33 - 33	06/30/2020	UFI CHM 2020-040	Liquid	FD	SLURRY			1124		
DEEP_S	OL-3514-03	33 - 33	06/30/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY			1888		

Onondaga Lake
2020 Sediment trap samples

							Parameter	TOTAL SUSPENDED SOLIDS	
							Method	SM2540D	
							Units	mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type		
DEEP_S	OL-3548-01	33 - 33	05/12/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-02	33 - 33	05/26/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-03	33 - 33	06/08/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-04	33 - 33	06/22/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-05	33 - 33	07/06/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-06	33 - 33	07/21/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-07	33 - 33	08/04/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-08	33 - 33	08/18/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-09	33 - 33	08/26/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3548-10	33 - 33	09/01/2020	0I00031	Liquid	REG	SLURRY		
DEEP_S	OL-3589-01	33 - 33	09/09/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-02	33 - 33	09/15/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-03	33 - 33	09/22/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-04	33 - 33	09/29/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-05	33 - 33	10/06/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-06	33 - 33	10/13/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-07	33 - 33	10/20/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-08	33 - 33	10/27/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-09	33 - 33	11/04/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3589-10	33 - 33	11/18/2020	0L00015	Liquid	REG	SLURRY		
DEEP_S	OL-3501-01	33 - 33	05/12/2020	UFI CHM 2020-021	Liquid	REG	SLURRY	7500	
DEEP_S	OL-3501-02	33 - 33	05/12/2020	UFI CHM 2020-021	Liquid	FD	SLURRY	8092	
DEEP_S	OL-3501-03	33 - 33	05/12/2020	UFI CHM 2020-021	Liquid	FD2	SLURRY	6164	
DEEP_S	OL-3504-01	33 - 33	05/20/2020	UFI CHM 2020-040	Liquid	REG	SLURRY	2512	
DEEP_S	OL-3504-02	33 - 33	05/20/2020	UFI CHM 2020-040	Liquid	FD	SLURRY	2448	
DEEP_S	OL-3504-03	33 - 33	05/20/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY	3076	
DEEP_S	OL-3505-01	33 - 33	05/26/2020	UFI CHM 2020-040	Liquid	REG	SLURRY	2224	
DEEP_S	OL-3505-02	33 - 33	05/26/2020	UFI CHM 2020-040	Liquid	FD	SLURRY	1916	
DEEP_S	OL-3505-03	33 - 33	05/26/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY	1604	
DEEP_S	OL-3506-01	33 - 33	06/01/2020	UFI CHM 2020-040	Liquid	REG	SLURRY	2592	
DEEP_S	OL-3506-02	33 - 33	06/01/2020	UFI CHM 2020-040	Liquid	FD	SLURRY	2360	
DEEP_S	OL-3506-03	33 - 33	06/01/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY	2156	
DEEP_S	OL-3507-01	33 - 33	06/08/2020	UFI CHM 2020-040	Liquid	REG	SLURRY	3132	
DEEP_S	OL-3507-02	33 - 33	06/08/2020	UFI CHM 2020-040	Liquid	FD	SLURRY	3204	
DEEP_S	OL-3507-03	33 - 33	06/08/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY	3232	
DEEP_S	OL-3509-01	33 - 33	06/16/2020	UFI CHM 2020-040	Liquid	REG	SLURRY	2908	
DEEP_S	OL-3509-02	33 - 33	06/16/2020	UFI CHM 2020-040	Liquid	FD	SLURRY	3152	
DEEP_S	OL-3509-03	33 - 33	06/16/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY	2368	
DEEP_S	OL-3512-01	33 - 33	06/22/2020	UFI CHM 2020-040	Liquid	REG	SLURRY	2324	
DEEP_S	OL-3512-02	33 - 33	06/22/2020	UFI CHM 2020-040	Liquid	FD	SLURRY	1652	
DEEP_S	OL-3512-03	33 - 33	06/22/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY	1708	
DEEP_S	OL-3514-01	33 - 33	06/30/2020	UFI CHM 2020-040	Liquid	REG	SLURRY	1008	
DEEP_S	OL-3514-02	33 - 33	06/30/2020	UFI CHM 2020-040	Liquid	FD	SLURRY	1260	
DEEP_S	OL-3514-03	33 - 33	06/30/2020	UFI CHM 2020-040	Liquid	FD2	SLURRY	2168	

Onondaga Lake
2020 Sediment trap samples

							Parameter	MERCURY		TOTAL FIXED SOLIDS	
							Method	E1631		SM2540E	
							Units	ug/l		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type				
DEEP_S	OL-3517-01	33 - 33	07/06/2020	UFI CHM 2020-052	Liquid	REG	SLURRY			1292	
DEEP_S	OL-3517-02	33 - 33	07/06/2020	UFI CHM 2020-052	Liquid	FD	SLURRY			1232	
DEEP_S	OL-3517-03	33 - 33	07/06/2020	UFI CHM 2020-052	Liquid	FD2	SLURRY			1568	
DEEP_S	OL-3521-01	33 - 33	07/14/2020	UFI CHM 2020-052	Liquid	REG	SLURRY			4468	
DEEP_S	OL-3521-02	33 - 33	07/14/2020	UFI CHM 2020-052	Liquid	FD	SLURRY			3556	
DEEP_S	OL-3521-03	33 - 33	07/14/2020	UFI CHM 2020-052	Liquid	FD2	SLURRY			4168	
DEEP_S	OL-3524-01	33 - 33	07/21/2020	UFI CHM 2020-067	Liquid	REG	SLURRY			1492	
DEEP_S	OL-3524-02	33 - 33	07/21/2020	UFI CHM 2020-067	Liquid	FD	SLURRY			1240	
DEEP_S	OL-3524-03	33 - 33	07/21/2020	UFI CHM 2020-067	Liquid	FD2	SLURRY			1420	
DEEP_S	OL-3528-01	33 - 33	07/28/2020	UFI CHM 2020-067	Liquid	REG	SLURRY			2488	
DEEP_S	OL-3528-02	33 - 33	07/28/2020	UFI CHM 2020-067	Liquid	FD	SLURRY			3644	
DEEP_S	OL-3528-03	33 - 33	07/28/2020	UFI CHM 2020-067	Liquid	FD2	SLURRY			2580	
DEEP_S	OL-3531-01	33 - 33	08/04/2020	UFI CHM 2020-074	Liquid	REG	SLURRY			3172	
DEEP_S	OL-3531-02	33 - 33	08/04/2020	UFI CHM 2020-074	Liquid	FD	SLURRY			2248	
DEEP_S	OL-3531-03	33 - 33	08/04/2020	UFI CHM 2020-074	Liquid	FD2	SLURRY			2544	
DEEP_S	OL-3535-01	33 - 33	08/11/2020	UFI CHM 2020-074	Liquid	REG	SLURRY			1964	
DEEP_S	OL-3535-02	33 - 33	08/11/2020	UFI CHM 2020-074	Liquid	FD	SLURRY			1372	
DEEP_S	OL-3535-03	33 - 33	08/11/2020	UFI CHM 2020-074	Liquid	FD2	SLURRY			1836	
DEEP_S	OL-3538-01	33 - 33	08/18/2020	UFI CHM 2020-080	Liquid	REG	SLURRY			1624	
DEEP_S	OL-3538-02	33 - 33	08/18/2020	UFI CHM 2020-080	Liquid	FD	SLURRY			2000	
DEEP_S	OL-3538-03	33 - 33	08/18/2020	UFI CHM 2020-080	Liquid	FD2	SLURRY			2252	
DEEP_S	OL-3542-01	33 - 33	08/26/2020	UFI CHM 2020-080	Liquid	REG	SLURRY			1604	
DEEP_S	OL-3542-02	33 - 33	08/26/2020	UFI CHM 2020-080	Liquid	FD	SLURRY			1308	
DEEP_S	OL-3542-03	33 - 33	08/26/2020	UFI CHM 2020-080	Liquid	FD2	SLURRY			1524	
DEEP_S	OL-3545-01	33 - 33	09/01/2020	UFI CHM 2020-098	Liquid	REG	SLURRY			1420	
DEEP_S	OL-3545-02	33 - 33	09/01/2020	UFI CHM 2020-098	Liquid	FD	SLURRY			1576	
DEEP_S	OL-3545-03	33 - 33	09/01/2020	UFI CHM 2020-098	Liquid	FD2	SLURRY			1532	
DEEP_S	OL-3550-01	33 - 33	09/09/2020	UFI CHM 2020-098	Liquid	REG	SLURRY			1320	
DEEP_S	OL-3550-02	33 - 33	09/09/2020	UFI CHM 2020-098	Liquid	FD	SLURRY			1364	
DEEP_S	OL-3550-03	33 - 33	09/09/2020	UFI CHM 2020-098	Liquid	FD2	SLURRY			1544	
DEEP_S	OL-3554-01	33 - 33	09/15/2020	UFI CHM 2020-110	Liquid	REG	SLURRY			1856	
DEEP_S	OL-3554-02	33 - 33	09/15/2020	UFI CHM 2020-110	Liquid	FD	SLURRY			1388	
DEEP_S	OL-3554-03	33 - 33	09/15/2020	UFI CHM 2020-110	Liquid	FD2	SLURRY			1548	
DEEP_S	OL-3558-01	33 - 33	09/22/2020	UFI CHM 2020-110	Liquid	REG	SLURRY			1160	
DEEP_S	OL-3558-02	33 - 33	09/22/2020	UFI CHM 2020-110	Liquid	FD	SLURRY			1068	
DEEP_S	OL-3558-03	33 - 33	09/22/2020	UFI CHM 2020-110	Liquid	FD2	SLURRY			1016	
DEEP_S	OL-3562-01	33 - 33	09/29/2020	UFI CHM 2020-116	Liquid	REG	SLURRY			764	
DEEP_S	OL-3562-02	33 - 33	09/29/2020	UFI CHM 2020-116	Liquid	FD	SLURRY			732	
DEEP_S	OL-3562-03	33 - 33	09/29/2020	UFI CHM 2020-116	Liquid	FD2	SLURRY			712	
DEEP_S	OL-3566-01	33 - 33	10/06/2020	UFI CHM 2020-116	Liquid	REG	SLURRY			1212	
DEEP_S	OL-3566-02	33 - 33	10/06/2020	UFI CHM 2020-116	Liquid	FD	SLURRY			920	
DEEP_S	OL-3566-03	33 - 33	10/06/2020	UFI CHM 2020-116	Liquid	FD2	SLURRY			928	
DEEP_S	OL-3570-01	33 - 33	10/13/2020	UFI CHM 2020-126	Liquid	REG	SLURRY			3760	
DEEP_S	OL-3570-02	33 - 33	10/13/2020	UFI CHM 2020-126	Liquid	FD	SLURRY			2408	

Onondaga Lake
2020 Sediment trap samples

							Parameter	TOTAL SUSPENDED SOLIDS	
							Method	SM2540D	
							Units	mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type		
DEEP_S	OL-3517-01	33 - 33	07/06/2020	UFI CHM 2020-052	Liquid	REG	SLURRY	1468	
DEEP_S	OL-3517-02	33 - 33	07/06/2020	UFI CHM 2020-052	Liquid	FD	SLURRY	1396	
DEEP_S	OL-3517-03	33 - 33	07/06/2020	UFI CHM 2020-052	Liquid	FD2	SLURRY	1760	
DEEP_S	OL-3521-01	33 - 33	07/14/2020	UFI CHM 2020-052	Liquid	REG	SLURRY	4908	
DEEP_S	OL-3521-02	33 - 33	07/14/2020	UFI CHM 2020-052	Liquid	FD	SLURRY	3928	
DEEP_S	OL-3521-03	33 - 33	07/14/2020	UFI CHM 2020-052	Liquid	FD2	SLURRY	4580	
DEEP_S	OL-3524-01	33 - 33	07/21/2020	UFI CHM 2020-067	Liquid	REG	SLURRY	1848	
DEEP_S	OL-3524-02	33 - 33	07/21/2020	UFI CHM 2020-067	Liquid	FD	SLURRY	1544	
DEEP_S	OL-3524-03	33 - 33	07/21/2020	UFI CHM 2020-067	Liquid	FD2	SLURRY	1700	
DEEP_S	OL-3528-01	33 - 33	07/28/2020	UFI CHM 2020-067	Liquid	REG	SLURRY	2788	
DEEP_S	OL-3528-02	33 - 33	07/28/2020	UFI CHM 2020-067	Liquid	FD	SLURRY	4036	
DEEP_S	OL-3528-03	33 - 33	07/28/2020	UFI CHM 2020-067	Liquid	FD2	SLURRY	2852	
DEEP_S	OL-3531-01	33 - 33	08/04/2020	UFI CHM 2020-074	Liquid	REG	SLURRY	3620	
DEEP_S	OL-3531-02	33 - 33	08/04/2020	UFI CHM 2020-074	Liquid	FD	SLURRY	2576	
DEEP_S	OL-3531-03	33 - 33	08/04/2020	UFI CHM 2020-074	Liquid	FD2	SLURRY	2892	
DEEP_S	OL-3535-01	33 - 33	08/11/2020	UFI CHM 2020-074	Liquid	REG	SLURRY	2368	
DEEP_S	OL-3535-02	33 - 33	08/11/2020	UFI CHM 2020-074	Liquid	FD	SLURRY	1644	
DEEP_S	OL-3535-03	33 - 33	08/11/2020	UFI CHM 2020-074	Liquid	FD2	SLURRY	2168	
DEEP_S	OL-3538-01	33 - 33	08/18/2020	UFI CHM 2020-080	Liquid	REG	SLURRY	1904	
DEEP_S	OL-3538-02	33 - 33	08/18/2020	UFI CHM 2020-080	Liquid	FD	SLURRY	2320	
DEEP_S	OL-3538-03	33 - 33	08/18/2020	UFI CHM 2020-080	Liquid	FD2	SLURRY	2608	
DEEP_S	OL-3542-01	33 - 33	08/26/2020	UFI CHM 2020-080	Liquid	REG	SLURRY	1944	
DEEP_S	OL-3542-02	33 - 33	08/26/2020	UFI CHM 2020-080	Liquid	FD	SLURRY	1588	
DEEP_S	OL-3542-03	33 - 33	08/26/2020	UFI CHM 2020-080	Liquid	FD2	SLURRY	1808	
DEEP_S	OL-3545-01	33 - 33	09/01/2020	UFI CHM 2020-098	Liquid	REG	SLURRY	1720	
DEEP_S	OL-3545-02	33 - 33	09/01/2020	UFI CHM 2020-098	Liquid	FD	SLURRY	1900	
DEEP_S	OL-3545-03	33 - 33	09/01/2020	UFI CHM 2020-098	Liquid	FD2	SLURRY	1832	
DEEP_S	OL-3550-01	33 - 33	09/09/2020	UFI CHM 2020-098	Liquid	REG	SLURRY	1704	
DEEP_S	OL-3550-02	33 - 33	09/09/2020	UFI CHM 2020-098	Liquid	FD	SLURRY	1768	
DEEP_S	OL-3550-03	33 - 33	09/09/2020	UFI CHM 2020-098	Liquid	FD2	SLURRY	2028	
DEEP_S	OL-3554-01	33 - 33	09/15/2020	UFI CHM 2020-110	Liquid	REG	SLURRY	2208	
DEEP_S	OL-3554-02	33 - 33	09/15/2020	UFI CHM 2020-110	Liquid	FD	SLURRY	1648	
DEEP_S	OL-3554-03	33 - 33	09/15/2020	UFI CHM 2020-110	Liquid	FD2	SLURRY	1812	
DEEP_S	OL-3558-01	33 - 33	09/22/2020	UFI CHM 2020-110	Liquid	REG	SLURRY	1484	
DEEP_S	OL-3558-02	33 - 33	09/22/2020	UFI CHM 2020-110	Liquid	FD	SLURRY	1392	
DEEP_S	OL-3558-03	33 - 33	09/22/2020	UFI CHM 2020-110	Liquid	FD2	SLURRY	1300	
DEEP_S	OL-3562-01	33 - 33	09/29/2020	UFI CHM 2020-116	Liquid	REG	SLURRY	1012	
DEEP_S	OL-3562-02	33 - 33	09/29/2020	UFI CHM 2020-116	Liquid	FD	SLURRY	960	
DEEP_S	OL-3562-03	33 - 33	09/29/2020	UFI CHM 2020-116	Liquid	FD2	SLURRY	904	
DEEP_S	OL-3566-01	33 - 33	10/06/2020	UFI CHM 2020-116	Liquid	REG	SLURRY	1524	
DEEP_S	OL-3566-02	33 - 33	10/06/2020	UFI CHM 2020-116	Liquid	FD	SLURRY	1192	
DEEP_S	OL-3566-03	33 - 33	10/06/2020	UFI CHM 2020-116	Liquid	FD2	SLURRY	1180	
DEEP_S	OL-3570-01	33 - 33	10/13/2020	UFI CHM 2020-126	Liquid	REG	SLURRY	4472	
DEEP_S	OL-3570-02	33 - 33	10/13/2020	UFI CHM 2020-126	Liquid	FD	SLURRY	2900	

Onondaga Lake
2020 Sediment trap samples

							Parameter	MERCURY		TOTAL FIXED SOLIDS	
							Method	E1631		SM2540E	
							Units	ug/l		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type				
DEEP_S	OL-3570-03	33 - 33	10/13/2020	UFI CHM 2020-126	Liquid	FD2	SLURRY			2656	
DEEP_S	OL-3574-01	33 - 33	10/20/2020	UFI CHM 2020-126	Liquid	REG	SLURRY			1636	
DEEP_S	OL-3574-02	33 - 33	10/20/2020	UFI CHM 2020-126	Liquid	FD	SLURRY			1552	
DEEP_S	OL-3574-03	33 - 33	10/20/2020	UFI CHM 2020-126	Liquid	FD2	SLURRY			1392	
DEEP_S	OL-3578-01	33 - 33	10/27/2020	UFI CHM 2020-127	Liquid	REG	SLURRY			2180	
DEEP_S	OL-3578-02	33 - 33	10/27/2020	UFI CHM 2020-127	Liquid	FD	SLURRY			2148	
DEEP_S	OL-3578-03	33 - 33	10/27/2020	UFI CHM 2020-127	Liquid	FD2	SLURRY			2512	
DEEP_S	OL-3582-01	33 - 33	11/04/2020	UFI CHM 2020-127	Liquid	REG	SLURRY			13816	
DEEP_S	OL-3582-02	33 - 33	11/04/2020	UFI CHM 2020-127	Liquid	FD	SLURRY			17632	
DEEP_S	OL-3582-03	33 - 33	11/04/2020	UFI CHM 2020-127	Liquid	FD2	SLURRY			12184	
DEEP_S	OL-3586-01	33 - 33	11/18/2020	UFI CHM 2020-137	Liquid	REG	SLURRY			7240	
DEEP_S	OL-3586-02	33 - 33	11/18/2020	UFI CHM 2020-137	Liquid	FD	SLURRY			5640	

Onondaga Lake
2020 Sediment trap samples

							Parameter	TOTAL SUSPENDED SOLIDS	
							Method	SM2540D	
							Units	mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type		
DEEP_S	OL-3570-03	33 - 33	10/13/2020	UFI CHM 2020-126	Liquid	FD2	SLURRY	3176	
DEEP_S	OL-3574-01	33 - 33	10/20/2020	UFI CHM 2020-126	Liquid	REG	SLURRY	2056	
DEEP_S	OL-3574-02	33 - 33	10/20/2020	UFI CHM 2020-126	Liquid	FD	SLURRY	1940	
DEEP_S	OL-3574-03	33 - 33	10/20/2020	UFI CHM 2020-126	Liquid	FD2	SLURRY	1744	
DEEP_S	OL-3578-01	33 - 33	10/27/2020	UFI CHM 2020-127	Liquid	REG	SLURRY	2648	
DEEP_S	OL-3578-02	33 - 33	10/27/2020	UFI CHM 2020-127	Liquid	FD	SLURRY	2608	
DEEP_S	OL-3578-03	33 - 33	10/27/2020	UFI CHM 2020-127	Liquid	FD2	SLURRY	2988	
DEEP_S	OL-3582-01	33 - 33	11/04/2020	UFI CHM 2020-127	Liquid	REG	SLURRY	15608	
DEEP_S	OL-3582-02	33 - 33	11/04/2020	UFI CHM 2020-127	Liquid	FD	SLURRY	19860	
DEEP_S	OL-3582-03	33 - 33	11/04/2020	UFI CHM 2020-127	Liquid	FD2	SLURRY	13728	
DEEP_S	OL-3586-01	33 - 33	11/18/2020	UFI CHM 2020-137	Liquid	REG	SLURRY	8264	
DEEP_S	OL-3586-02	33 - 33	11/18/2020	UFI CHM 2020-137	Liquid	FD	SLURRY	6424	

APPENDIX 5A SUMMARY OF 2020 APPLICATIONS OF NITRATE IN ONONDAGA LAKE

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APPENDIX 5A SUMMARY OF 2020 APPLICATIONS OF NITRATE IN ONONDAGA LAKE

Date		7-Jul-2020	09-Jul-2020	13-Jul-2020	15-Jul-2020	16-Jul-2020	20-Jul-2020	21-Jul-2020	22-Jul-2020	27-Jul-2020	29-Jul-2020	30-Jul-2020
Location		South 1	South 2	South 1	North	South 2	South 1	North	South 2	South 1	North	South 2
Dilution Factor (epilimnion water flow divided by nitrate flow)		242	284	276	295	286	286	148	316	270	291	263
Nitrate Flow_gauge	gpm	14	12.5	13	12	12.5	12	12	11.5	13	12.5	13.5
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	gpm	11.20	10.00	10.40	9.60	10.00	9.60	9.60	9.20	10.40	10.00	10.80
Epilimion Water Flow_System A	gpm	2620	2840	2833	2713	2741	2709	2840	2829	2727	2841	2784
Epilimion Water Flow_System B	gpm	2792	2840	2911	2950	2983	2778	0	2978	2895	2969	2901
Water temperature_epilimnion	degrees C	25.9	26.27	26.1	25.11	24.58	25.62	25.02	25.48	26.3	26.07	25.9
Conductance_epilimnion (field)	uS/cm	1910	1899	1892	1908	1916	1878	1854	1862	1899	1861	1881
Specific conductance_epilimnion (calc)	uS/cm	1878	1854	1853	1904	1931	1856	1853	1845	1853	1824	1849
Target Water Depth for Adding Nitrate	feet	60	60	60	50	60	60	50	60	60	50	60
Water Temperature _target depth	degrees C	11.7	8.88	9.34	9.81	8.85	9.13	9.18	9.03	9.51	9.12	9.86
Conductance _target depth (field)	uS/cm		1769	1781	1794	1785	1777	1784	1798	1794	1798	1805
Specific Conductance _target depth (calc)	uS/cm	0	2556	2541	2527	2581	2550	2556	2587	2548	2581	2539
Start time_dosing	24-hour clock	10:35	08:20	12:20	08:40	08:25	11:20	09:15	10:30	12:45	08:15	09:00
Start Volume_Tank A	gallons	2255.76	2600	2538	2569	2569	2569	2506	2569	2569	2538	2569
Start Volume_Tank B	gallons	2569.06	2569	2538	2538	2569	2569	2506	2569	2600	2538	2569
End Volume_Tank A	gallons	501.28	627	627	564	627	627	564	627	627	627	627
End Volume_Tank B	gallons	501.28	627	627	627	627	627	564	627	564	627	627
Total Volume of CN-8 Applied	gallons	3822	3915	3822	3916	3884	3884	3884	3884	3978	3822	3884
Total Mass of CN-8 Applied	lbs as nitrogen	4046	4144	4046	4145	4111	4111	4111	4111	4211	4046	4111
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 14.0 gpm, then adjusted to final	Started CN8 flowrate at 12.5 gpm, then adjusted to final	Started CN8 flowrate at 13.0 gpm, then adjusted to final	Started CN8 flowrate at 12.0 gpm, then adjusted to final	Started CN8 flowrate at 12.5 gpm, then adjusted to final	Started CN8 flowrate at 12.0 gpm, then adjusted to final	System B had mechanical issues during start up. Both Tank A and B were applied through system A.	Started CN8 flowrate at 11.5 gpm, then adjusted to final	Started Cn8 flowrate at 13 gpm, then adjusted to final. Off water from 15:30 to 16:15 due to thunderstorms.	Started CN8 flowrate at 12.5 gpm, then adjusted to final	Started CN8 flowrate at 13.5 gpm, then adjusted to final
End Time_dosing	24-hour clock	13:30	11:30	15:35	12:22	11:42	14:37	15:15	13:47	16:25	11:15	12:10

Notes:

1. Data in this table include initial setup readings of pumps and meters as well as final application readings. Comments include changes during run time and variations from final CN-8 flow.
2. CN8 flow rate in the table is represented as an average for two chemical pumps with differing flow rates.

Definitions:

1. CN-8: Liquid calcium nitrate provided by Yara Chemical. The density of CN-8 is 1.48 times the density of water.
2. Dilution factor is the ratio of dilution water flow from the lake epilimnion to flow of CN-8. The density of the water:CN-8 mixture varies daily with lake water temperature and salinity. Specific conductance values were measured to quantify salinity.
3. gpm: gallons per minute
4. uS/cm: Microsiemens per centimeter, or the unit of measure of specific conductance.
5. Start Volume and End Volume: Applies to CN-8.
6. Target Depth: The specific depth of release of the CN-8 as controlled by the length of individual hoses which were manually connected to the manifold prior to each application. Early on in the season the target depth identified by a height of 2-3m off of the bottom depending on what the specific water depth was at N, S1 or S2 on a given day. Where the target depths are not consistent with being 2 to 3 meters above the lake bottom, the target depths were based on monitoring within the hypolimnion at the N, S1 or S2 application locations and recent nitrate demand at each location.
7. MT NO3-N: Metric tons of nitrate-nitrogen. One metric ton is 1,000 kilograms or 2,240 pounds.

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APPENDIX 5A SUMMARY OF 2020 APPLICATIONS OF NITRATE IN ONONDAGA LAKE

Date		03-Aug-2020	05-Aug-2020	10-Aug-2020	12-Aug-2020	13-Aug-2020	17-Aug-2020	19-Aug-2020	20-Aug-2020	24-Aug-2020	25-Aug-2020	31-Aug-2020
Location		South 1	North	South 1	North	South 2	South 1	North	South 2	South 1	North	South 1
Dilution Factor (epilimnion water flow divided by nitrate flow)		272	284	293	296	282	284	300	291	303	282	294
Nitrate Flow_gauge	gpm	13	12.5	12	12	12.5	12.5	12	12	11.5	12.5	12
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	gpm	10.40	10.00	9.60	9.60	10.00	10.00	9.60	9.60	9.20	10.00	9.60
Epilimion Water Flow_System A	gpm	2731	2832	2747	2758	2716	2819	2784	2701	2687	2816	2816
Epilimion Water Flow_System B	gpm	2922	2842	2871	2917	2922	2860	2981	2879	2880	2825	2820
Water temperature_epilimnion	degrees C	24.9	24.51	25.66	25.87	25.35	24.9	24.15	23.79	25.16	24.61	22.41
Conductance_epilimnion (field)	uS/cm	1936	1884	1920	1889	1910	1948	1970	1977	1979	1966	2010
Specific conductance_epilimnion (calc)	uS/cm	1940	1902	1896	1858	1897	1952	2003	2024	1973	1981	2115
Target Water Depth for Adding Nitrate	feet	60	50	60	50	60	60	50	60	60	50	60
Water Temperature _target depth	degrees C	9.36	10.1	9.25	9.41	8.98	10.9	9.35	9.32	9.38	9.18	9.02
Conductance _target depth (field)	uS/cm	1791	1807	1800	1797	1802	1845	1806	1806	1808	1805	1823
Specific Conductance _target depth (calc)	uS/cm	2554	2526	2574	2559	2596	2525	2576	2578	2577	2587	2624
Start time_dosing	24-hour clock	11:20	08:10	11:50	09:20	08:20	11:20	08:00	07:50	11:40	09:52	11:20
Start Volume_Tank A	gallons	2569	2538	2538	2569	2569	2569	2569	2569	2475	2569	2569
Start Volume_Tank B	gallons	2569	2569	2538	2569	2569	2569	2569	2569	2506	2569	2569
End Volume_Tank A	gallons	376	376	439	376	376	376	376	376	376	376	376
End Volume_Tank B	gallons	345	376	376	376	376	407	407	407	376	376	376
Total Volume of CN-8 Applied	gallons	4417	4355	4261	4386	4386	4355	4355	4355	4229	4386	4386
Total Mass of CN-8 Applied	lbs as nitrogen	4675	4610	4510	4643	4643	4610	4610	4610	4476	4643	4643
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 13.0 gpm, then adjusted to final	Started CN8 flowrate at 12.5 gpm, then adjusted to final	Started CN8 flowrate at 12.0 gpm, then adjusted to final	Started CN8 flowrate at 12.0 gpm, then adjusted to final	Started CN8 flowrate at 12.5 gpm, then adjusted to final	Started CN8 flowrate at 12.5 gpm, then adjusted to final	Started CN8 flowrate at 12.0 gpm, then adjusted to final	Started CN8 flowrate at 12.0 gpm, then adjusted to final	Started CN8 flowrate at 11.5 gpm, then adjusted to final	Started CN8 flowrate at 12.5 gpm, then adjusted to final	Started CN8 flowrate at 12.0 gpm, then adjusted to final
End Time_dosing	24-hour clock	15:16	12:02	15:32	12:58	11:56	15:11	11:58	12:18	15:32	13:47	16:06

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APPENDIX 5A SUMMARY OF 2020 APPLICATIONS OF NITRATE IN ONONDAGA LAKE

Date		02-Sep-2020	03-Sep-2020	08-Sep-2020	10-Sep-2020	14-Sep-2020	16-Sep-2020	17-Sep-2020	21-Sep-2020	23-Sep-2020	24-Sep-2020	28-Sep-2020
Location		North	South 2	South 1	North	South 1	North	South 2	South 1	North	South 2	South 1
Dilution Factor (epilimnion water flow divided by nitrate flow)		377	393	402	422	375	518	472	501	598	558	625
Nitrate Flow_gauge	gpm	9.5	9	9	8.5	9.5	7	7.5	7	6	6	5.5
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	gpm	7.60	7.20	7.20	6.80	7.60	5.60	6.00	5.60	4.80	4.80	4.40
Epilimion Water Flow_System A	gpm	2792	2749	2810	2815	2773	2819	2739	2747	2843	2729	2726
Epilimion Water Flow_System B	gpm	2939	2903	2974	2924	2920	2978	2922	2866	2899	2630	2774
Water temperature_epilimnion	degrees C	22.07	21.9	21.24	21.67	20.1	19.63	19.52	17.8	17.65	17.7	18.2
Conductance_epilimnion (field)	uS/cm	2035	2026	2082	2043	2079	2075	2076	2088	2095	2099	2109
Specific conductance_epilimnion (calc)	uS/cm	2156	2154	2243	2182	2294	2312	2319	2421	2437	2439	2424
Target Water Depth for Adding Nitrate	feet	50	60	60	50	60	50	60	60	50	60	60
Water Temperature _target depth	degrees C	9.72	9.26	9.44	9.58	9.46	9.65	11.76	9.45	9.83	9.48	9.55
Conductance _target depth (field)	uS/cm	1803	1810	1824	1829	1828	1821	2338	1834	1827	1838	1890
Specific Conductance _target depth (calc)	uS/cm	2546	2588	2595	2593	2600	2576	3129	2609	2572	2612	2681
Start time_dosing	24-hour clock	08:09	08:09	11:40	08:40	11:10	08:05	09:00	10:55	08:03	08:04	10:49
Start Volume_Tank A	gallons	2569	2569	2569	2569	2569	2569	2569	2569	2569	2569	2569
Start Volume_Tank B	gallons	2569	2569	2569	2569	2569	2569	2569	2569	2569	2569	2569
End Volume_Tank A	gallons	376	376	376	376	376	407	376	564	376	376	752
End Volume_Tank B	gallons	376	376	376	376	376	345	376	564	376	376	689
Total Volume of CN-8 Applied	gallons	4386	4386	4386	4386	4386	4386	4386	4010	4386	4386	3697
Total Mass of CN-8 Applied	lbs as nitrogen	4643	4643	4643	4643	4643	4643	4643	4245	4643	4643	3913
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 9.5 gpm, then adjusted to final	Started CN8 flowrate at 9.0 gpm, then adjusted to final	Started CN8 flowrate at 9 gpm, then adjusted to final.Starboard pump reading "fuel pump ass 1"	Started CN8 flowrate at 8.5 gpm, then adjusted to final	Started CN8 flowrate at 9.5 gpm, then adjusted to final	Started CN8 flowrate at 7.00 gpm, then adjusted to final	Started CN8 flowrate at 7.5 gpm, then adjusted to final	Started CN8 flowrate at 7.00 gpm, then adjusted to final	Shut down at 10:03 to let UFI takes casts. Restarted pumps at 10:10 and incresed flow to 7.0gpm.	Started CN8 flowrate at 6.0 gpm, then adjusted to final	Started CN8 flowrate at 5.5 gpm, then adjusted to final
End Time_dosing	24-hour clock	13:21	13:20	17:04	13:40	17:32	14:29	15:38	18:00	15:53	16:19	17:50

Honeywell

PARSONS

APPENDIX 5A SUMMARY OF 2020 APPLICATIONS OF NITRATE IN ONONDAGA LAKE

Date		30-Sep-2020	05-Oct-2020	08-Oct-2020	09-Oct-2020	12-Oct-2020	13-Oct-2020	14-Oct-2020
Location		North	South 2	North	South 1	South 1	South 1	South 1
Dilution Factor (epilimnion water flow divided by nitrate flow)		635	532	704	682	865	854	228
Nitrate Flow_gauge	gpm	5.5	6.5	5	5	4	4	15
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	gpm	4.40	5.20	4.00	4.00	3.20	3.20	12.00
Epilimion Water Flow_System A	gpm	2793	2769	2795	2710	2790	2740	2740
Epilimion Water Flow_System B	gpm	2798	2768	2839	2743	2744	2725	2720
Water temperature_epilimnion	degrees C	18.92	16.43	15.37	15.1	15.02	14.76	14.71
Conductance_epilimnion (field)	uS/cm	2090	2114	2107	2128	2127	2121	2123
Specific conductance_epilimnion (calc)	uS/cm	2365	2528	2582	2624	2628	2637	2642
Target Water Depth for Adding Nitrate	feet	50	60	50	60	60	60	60
Water Temperature _target depth	degrees C	9.8	9.79	10.14	10.11	10.43	10.22	10.83
Conductance _target depth (field)	uS/cm	1870	1890	1901	1894	1947	2003	2084
Specific Conductance _target depth (calc)	uS/cm	2635	2664	2654	2647	2698	2791	2857
Start time_dosing	24-hour clock	08:04	10:25	08:02	09:20	11:39	10:28	14:45
Start Volume_Tank A	gallons	2569	2569	2569	2569	2820	1723	1410
Start Volume_Tank B	gallons	2569	2569	2569	2569	2820	2037	1598
End Volume_Tank A	gallons	376	752	376	1128	1723	125	0
End Volume_Tank B	gallons	376	752	376	1128	1661	282	0
Total Volume of CN-8 Applied	gallons	4386	3634	4386	2882	2256	3353	3008
Total Mass of CN-8 Applied	lbs as nitrogen	4643	3847	4643	3051	2388	3549	3184
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 5.5 gpm, then adjusted to final	Started CN8 flowrate at 6.5 gpm, then adjusted to final	Started CN8 flow at 5gpm, then adjusted to final.Starboard completed at 16:31, Port completed at 17:10	Started CN8 flowrate at 5.0 gpm, then adjusted to final. End volume high due to slow flow rate.	Started CN8 flowrate at 4.0 gpm, then adjusted to final.End volume high due to slow flow rate.	Started CN8 flowrate at 4.0 gpm, then adjusted to final	Diluted Chemical Application and tank rinse.
End Time_dosing	24-hour clock	15:10	17:57	14:52	17:03	17:45	17:42	07:21

APPENDIX 5B - EXAMPLE 2020 SUNA ONE-DAY DATA REPORT – OCTOBER 26, 2020

Onondaga Lake Nitrate Monitoring Summary: Current Status of Nitrate Conditions in Onondaga Lake

Full Scale Nitrate Addition, 2020 Monitoring

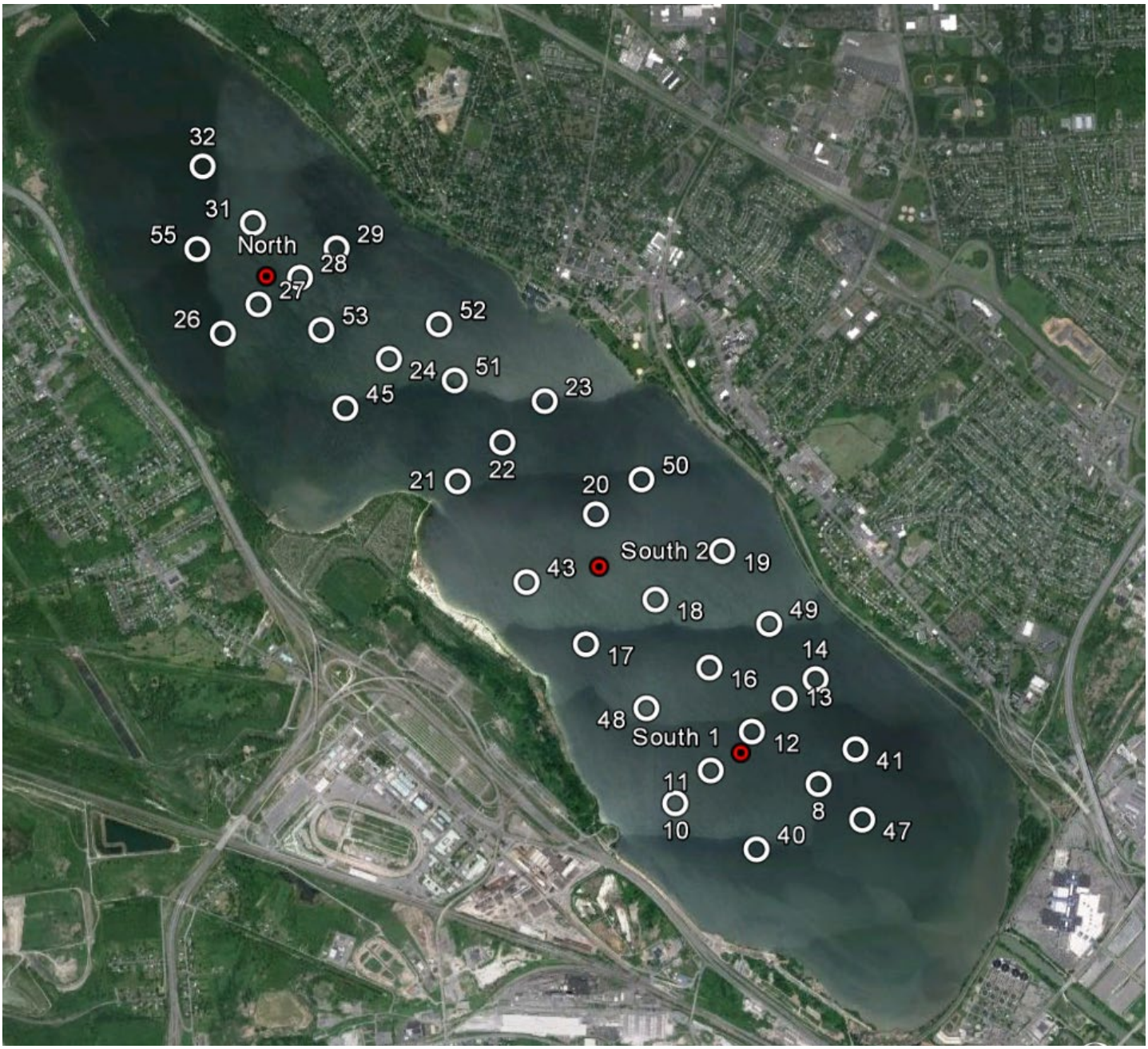
October 26, 2020

UPSTATE FRESHWATER INSTITUTE

Provisional Data Summary
for discussion purposes only

Submitted: for internal use only

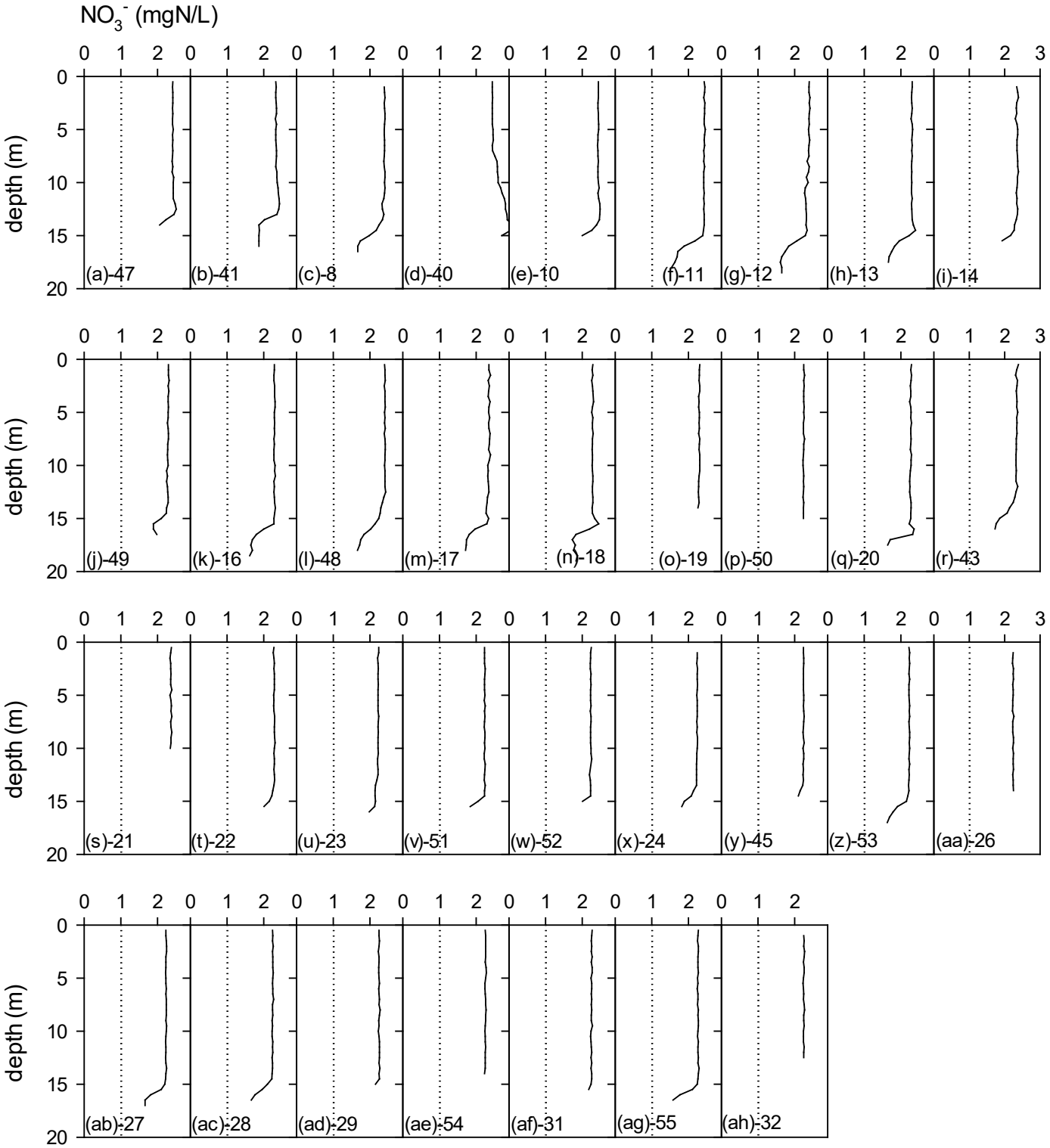
Gridding Locations



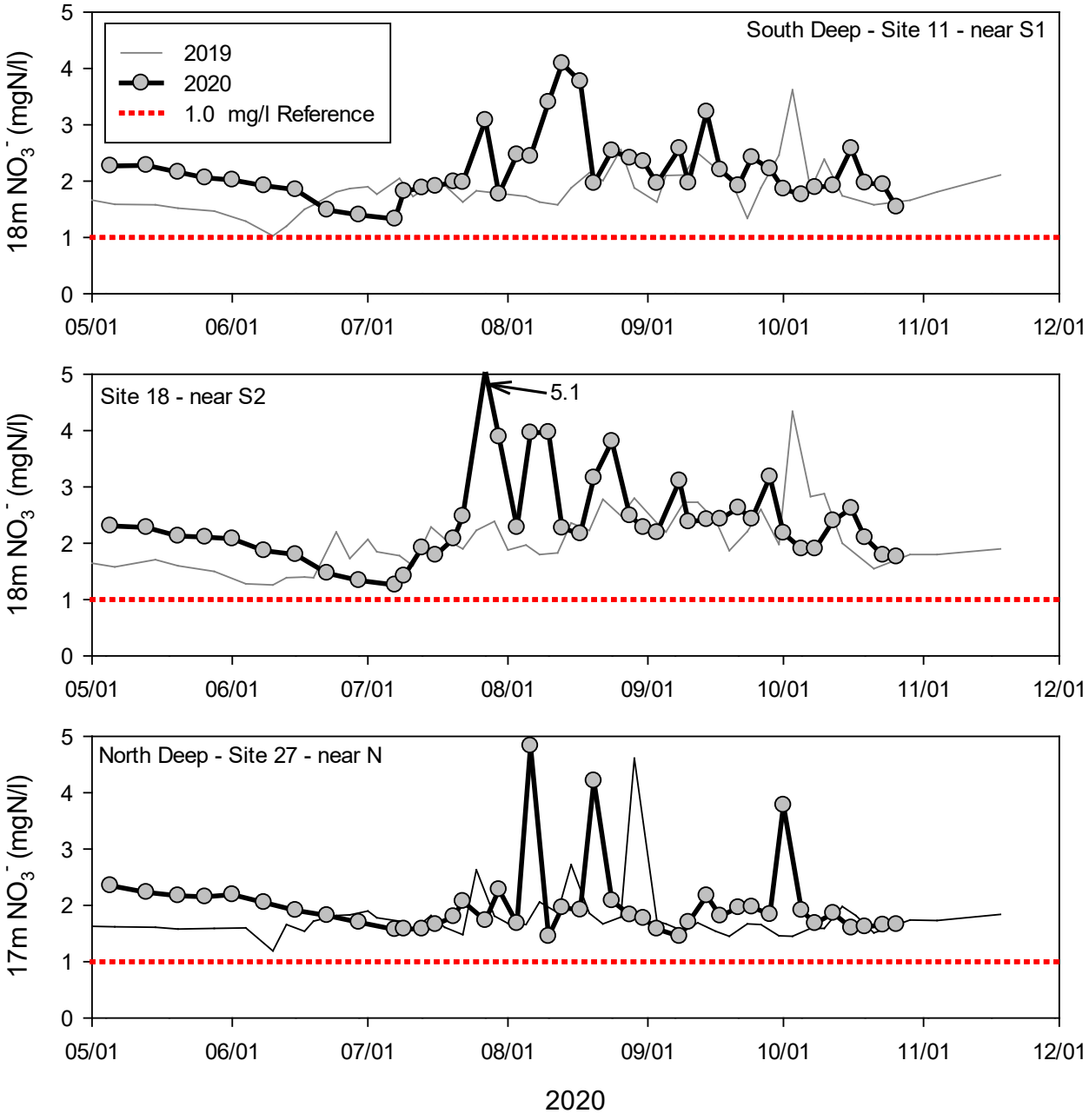
Today's injection: **None**

white circle: gridding loocation
red circle: injection site

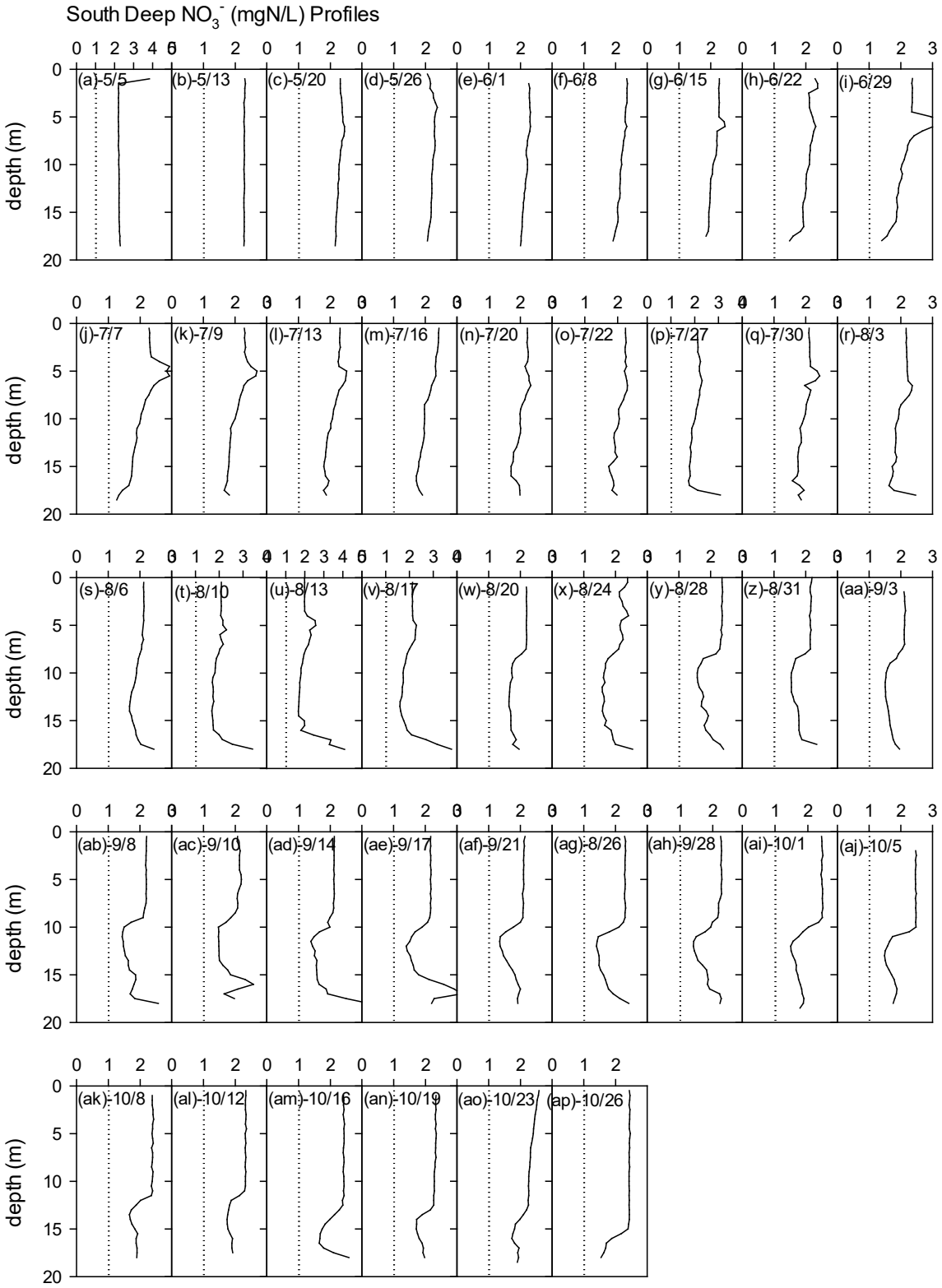
Nitrate Profiles at Each Gridding Location (mgN/L)



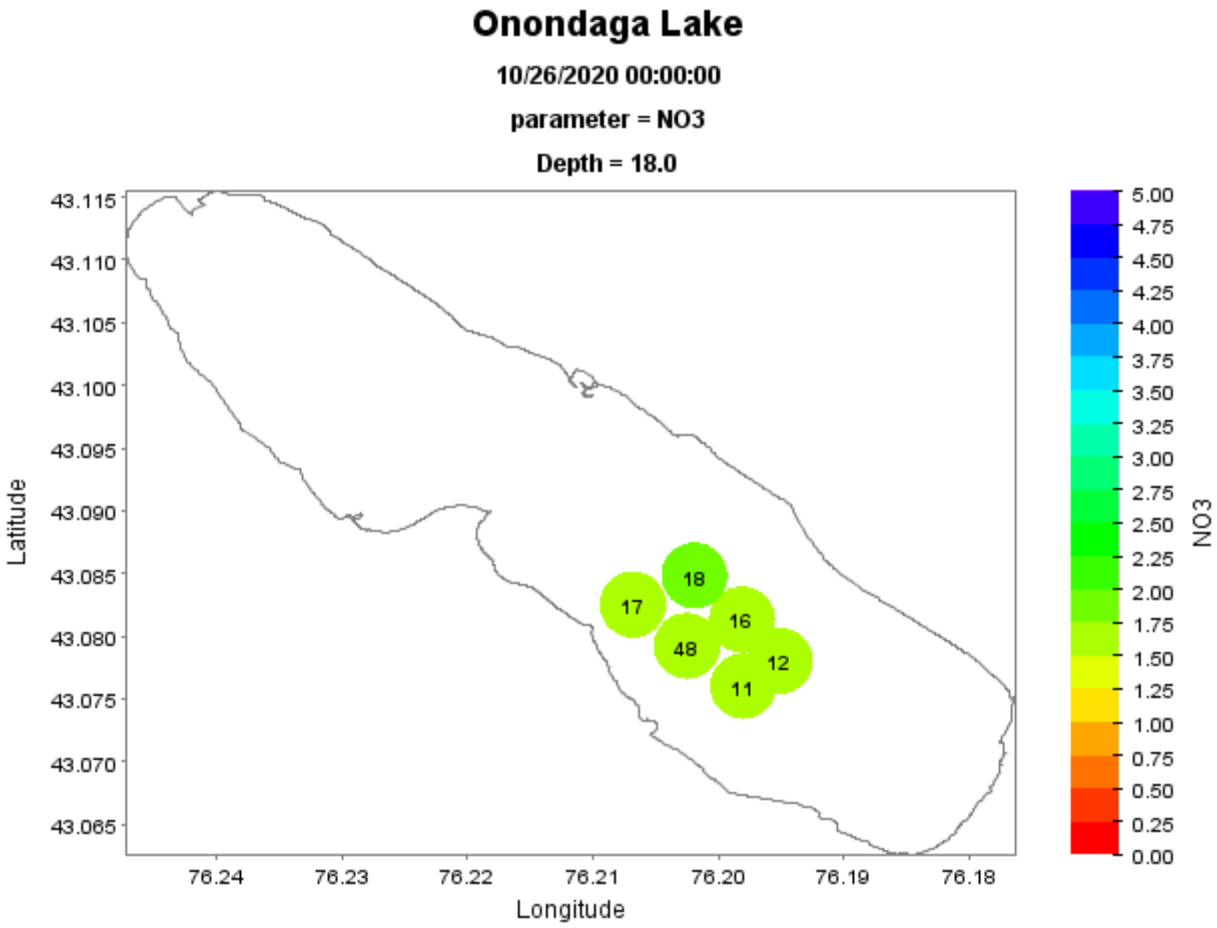
Nitrate Time Series at South Deep - 18m, Site 18 - 18m, North Deep - 17m



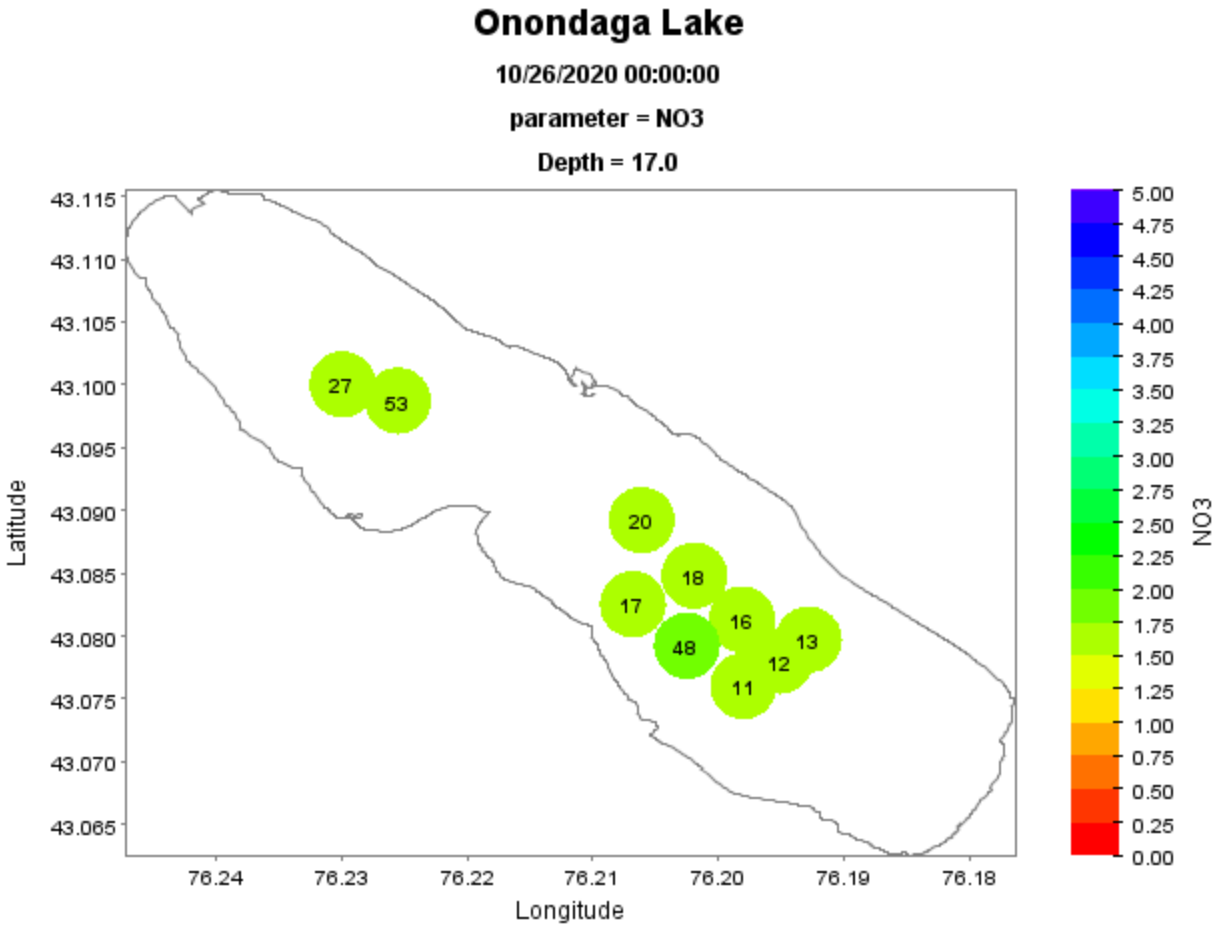
Nitrate Profiles at South Deep



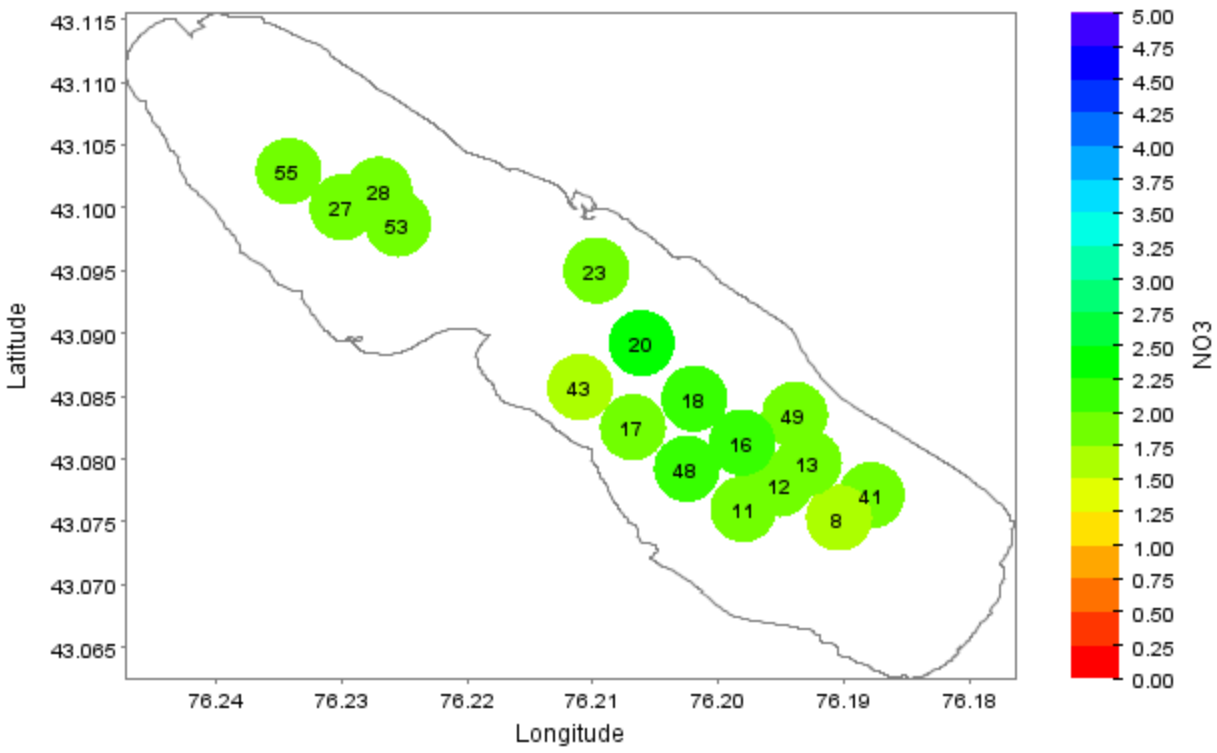
Spatial variations in Nitrate at selected depths



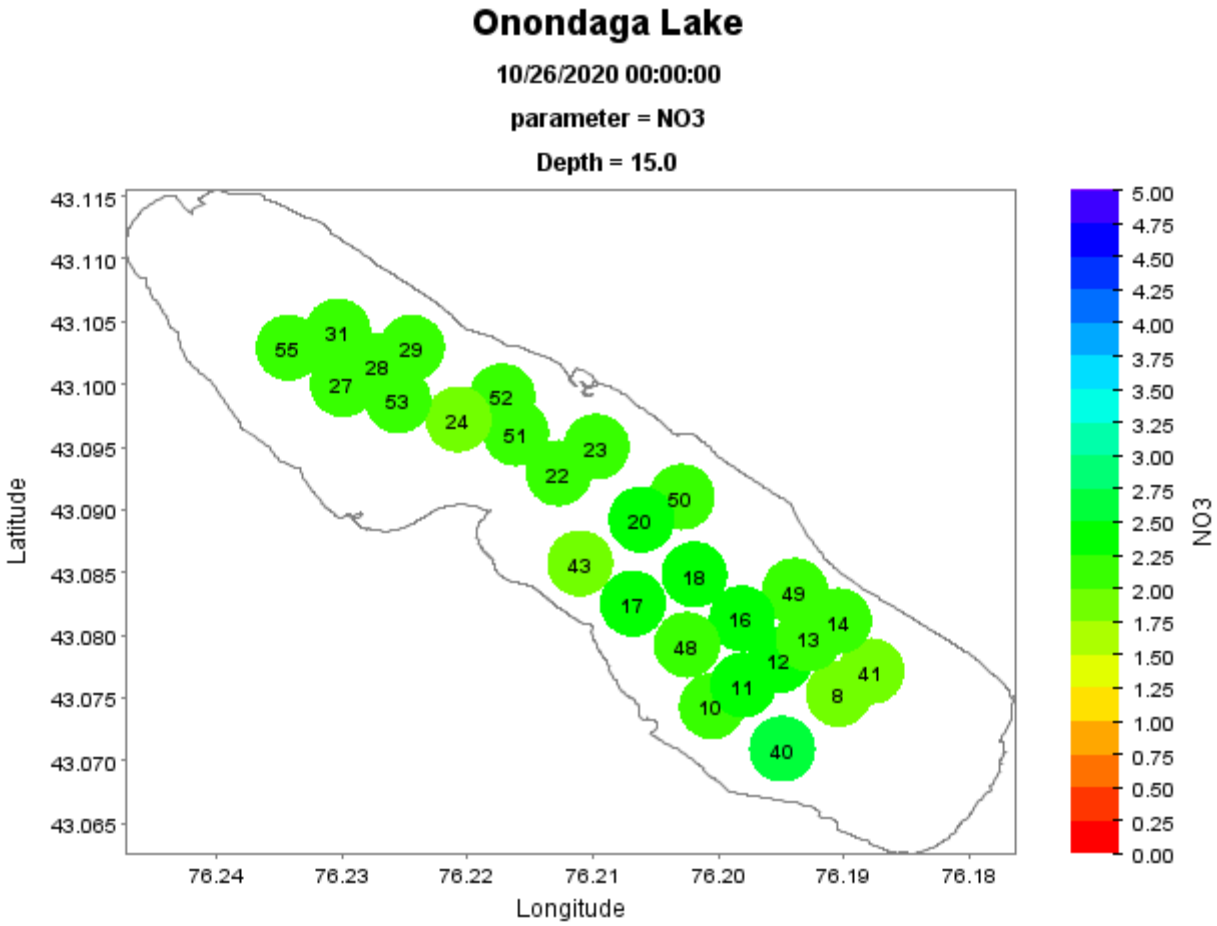
October 26, 2020



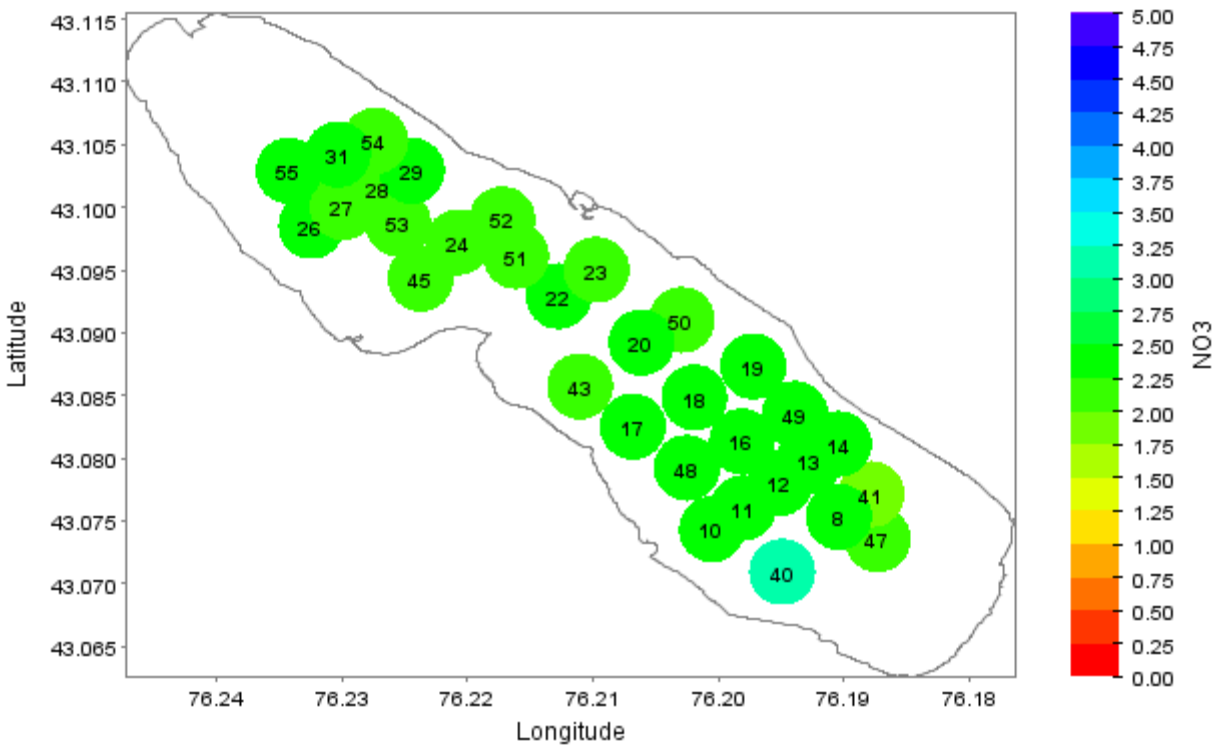
October 26, 2020



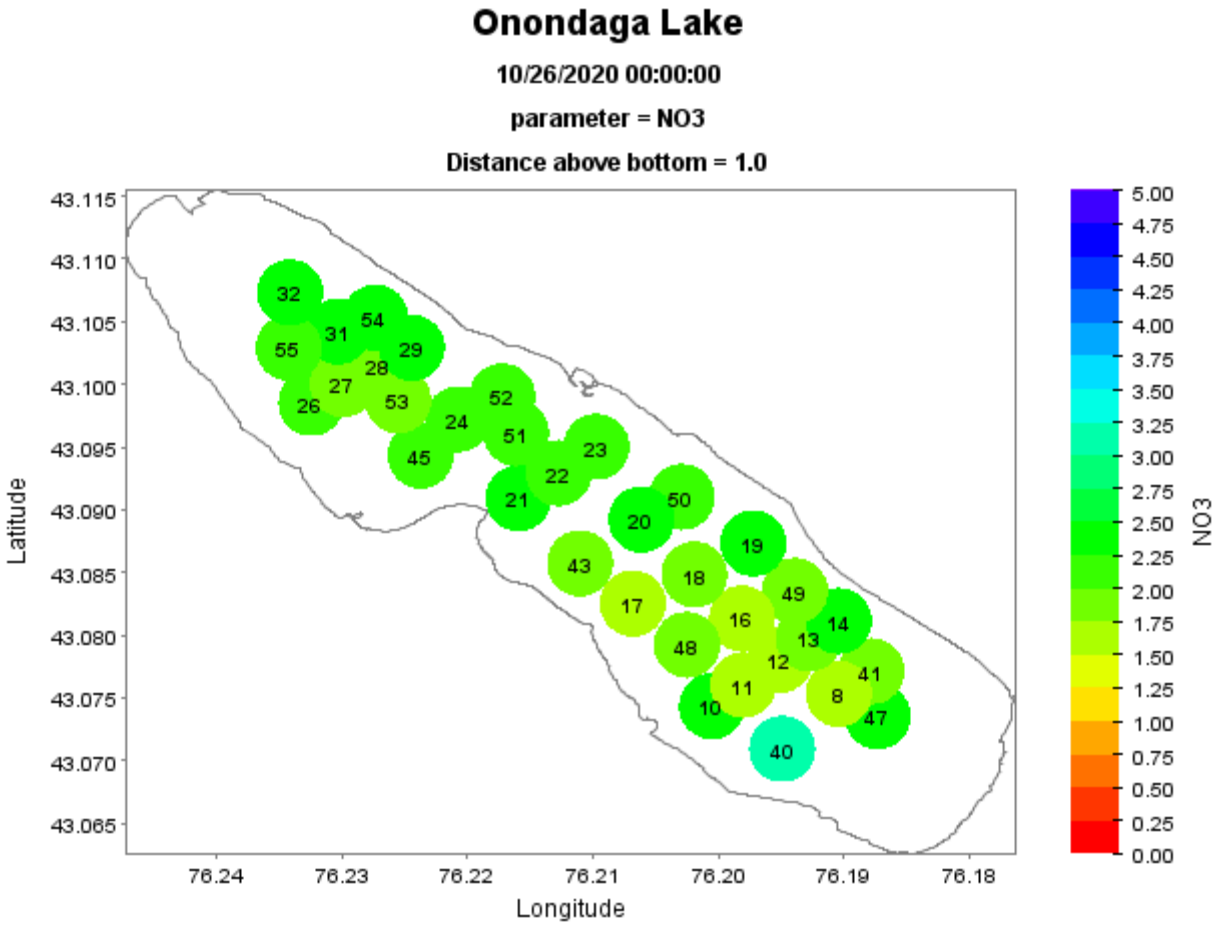
October 26, 2020



October 26, 2020



October 26, 2020



October 26, 2020

APPENDIX 5C - ONONDAGA LAKE GRIDDING SUMMARY USING A SUBMERSIBLE ULTRAVIOLET NITRATE ANALYZER – ONE METER OFF BOTTOM WEEKLY SUMMARY – MAY 5 THROUGH NOVEMBER 16, 2020

Onondaga Lake Nitrate Monitoring Summary: Current Status of Nitrate Conditions in Onondaga Lake

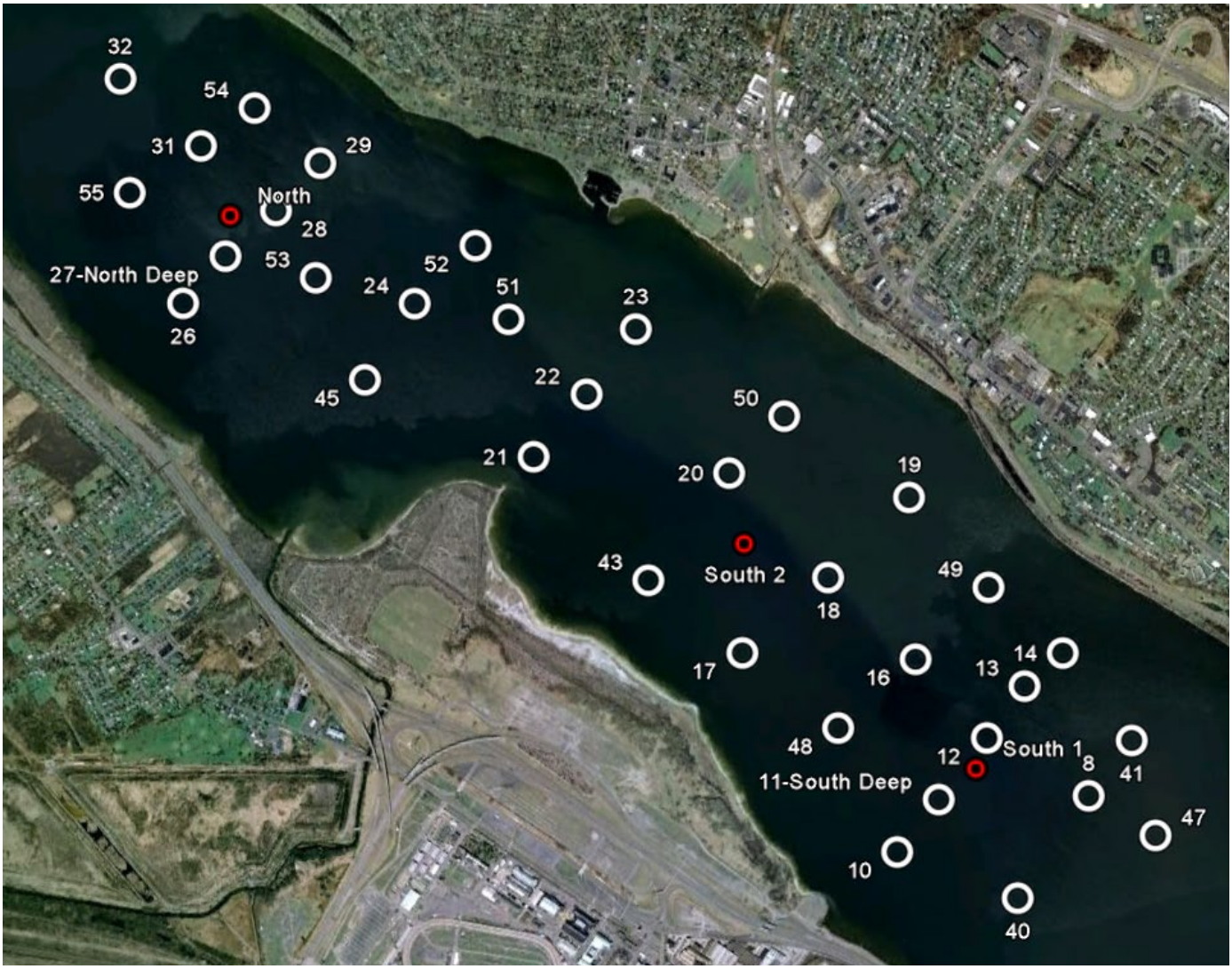
Full Scale Nitrate Addition, 2020 Monitoring

One Meter Off Bottom Weekly Summary:

May 05 through November 16, 2020



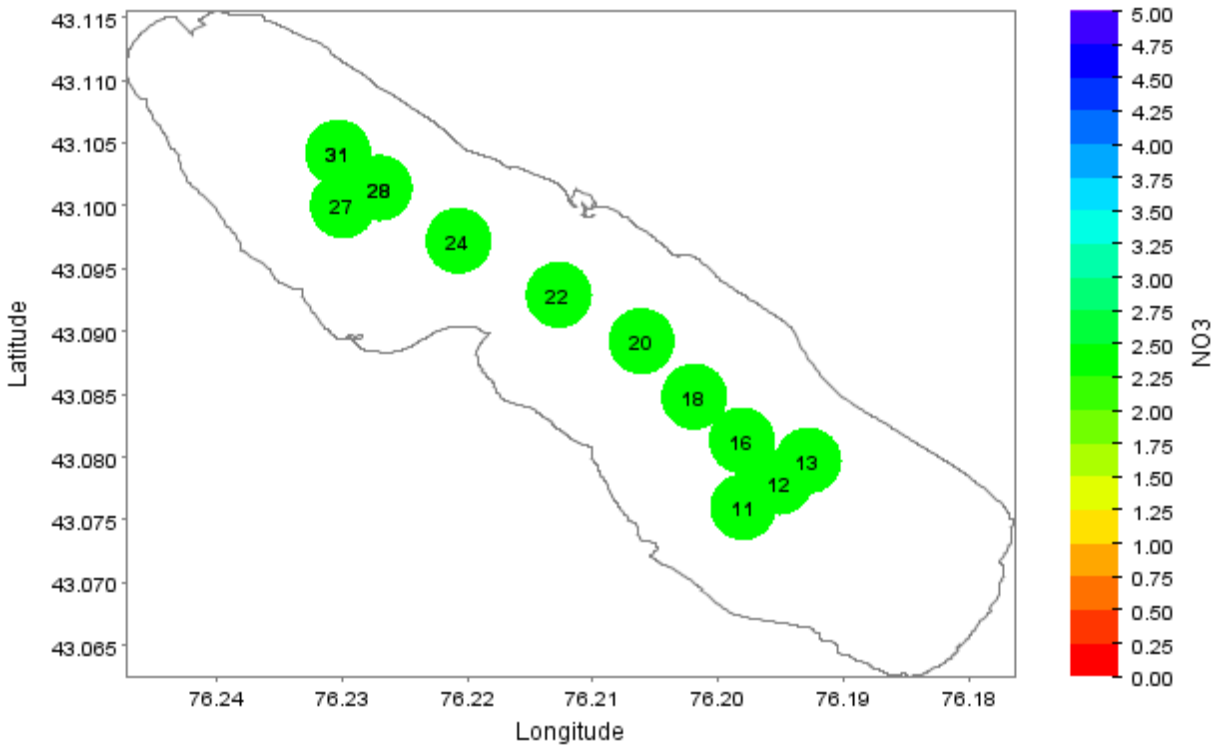
Monitoring Survey Locations



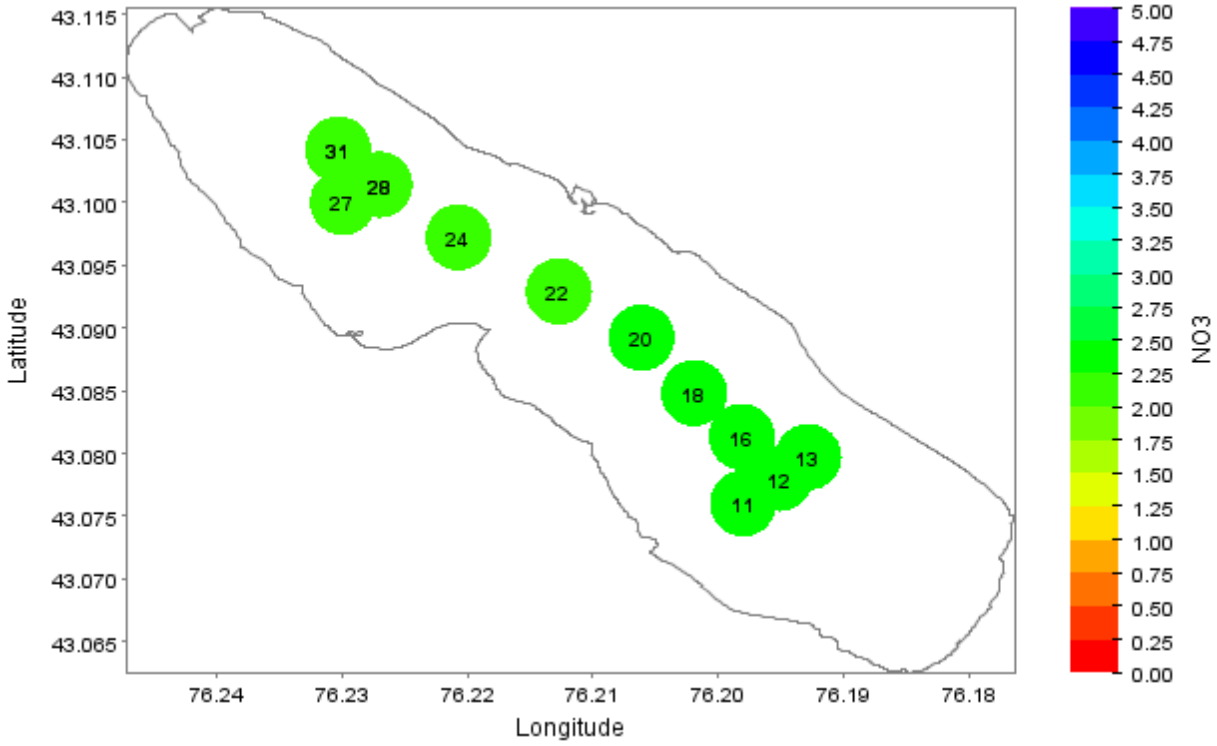
white circle: survey location
red circle: injection site

Color Bubble Plots at ~1.0 m off Bottom, Nitrate (mgN/L)

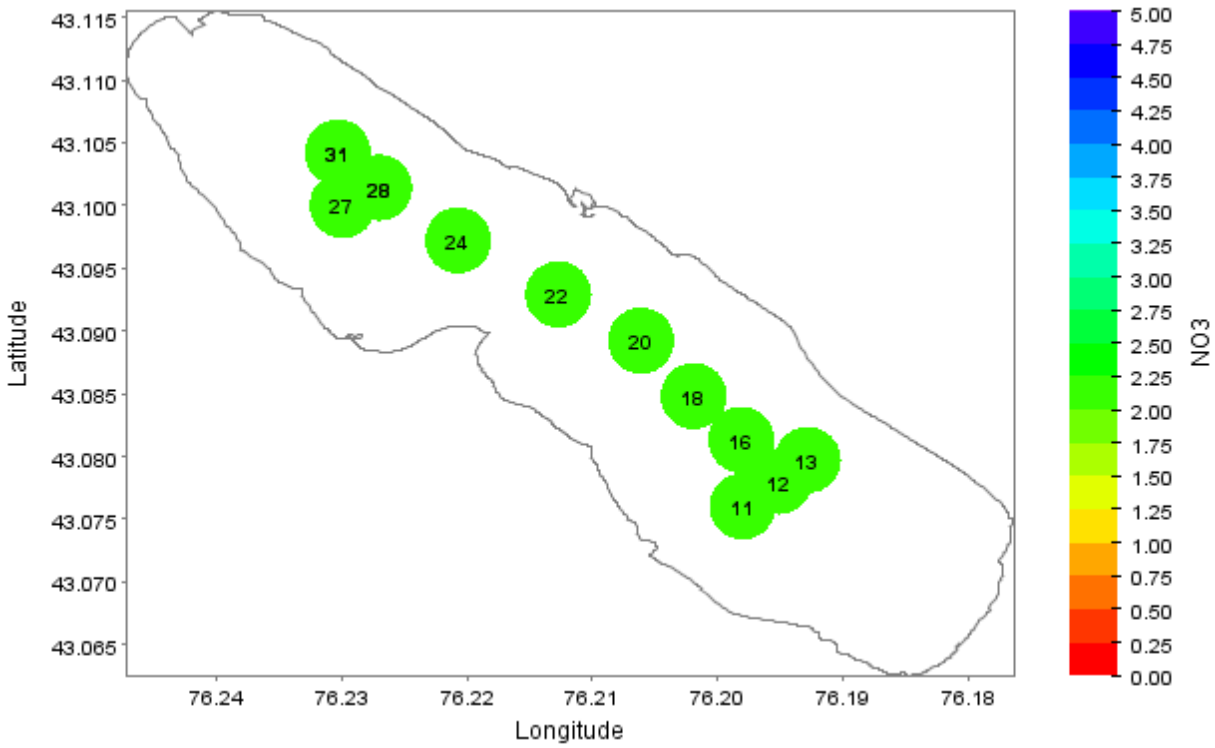
May 05, 2020



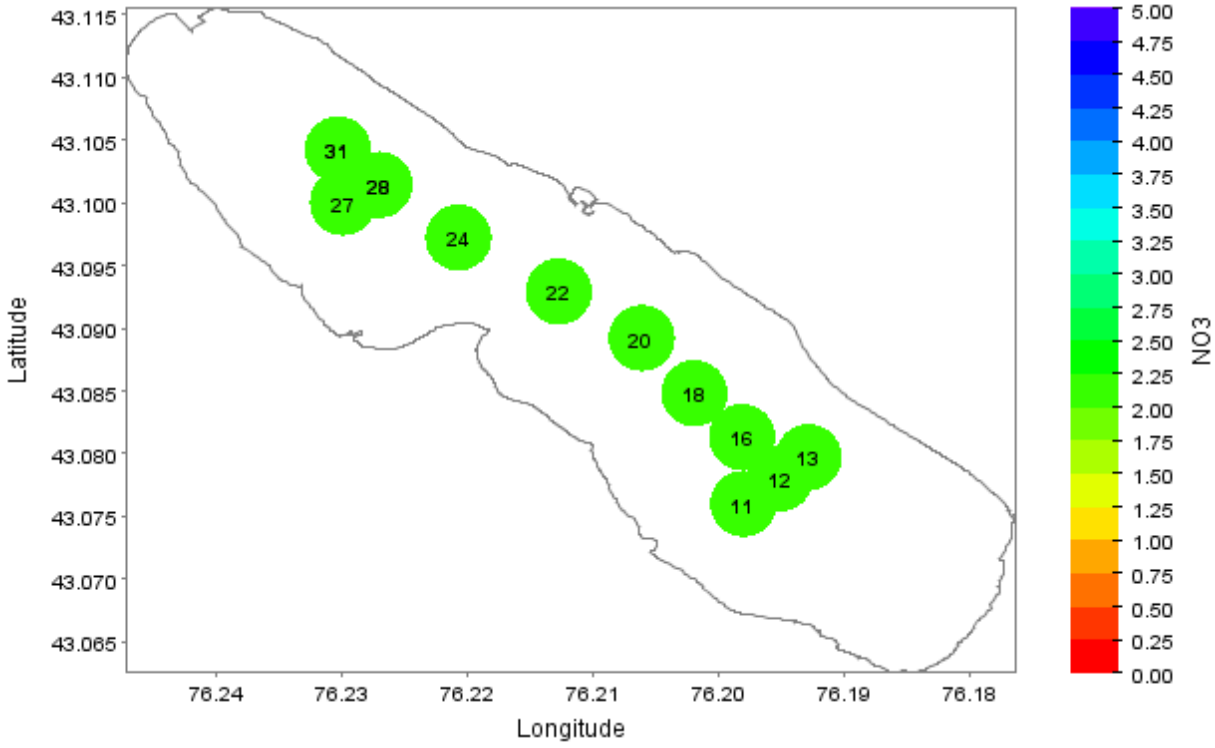
May 13, 2020



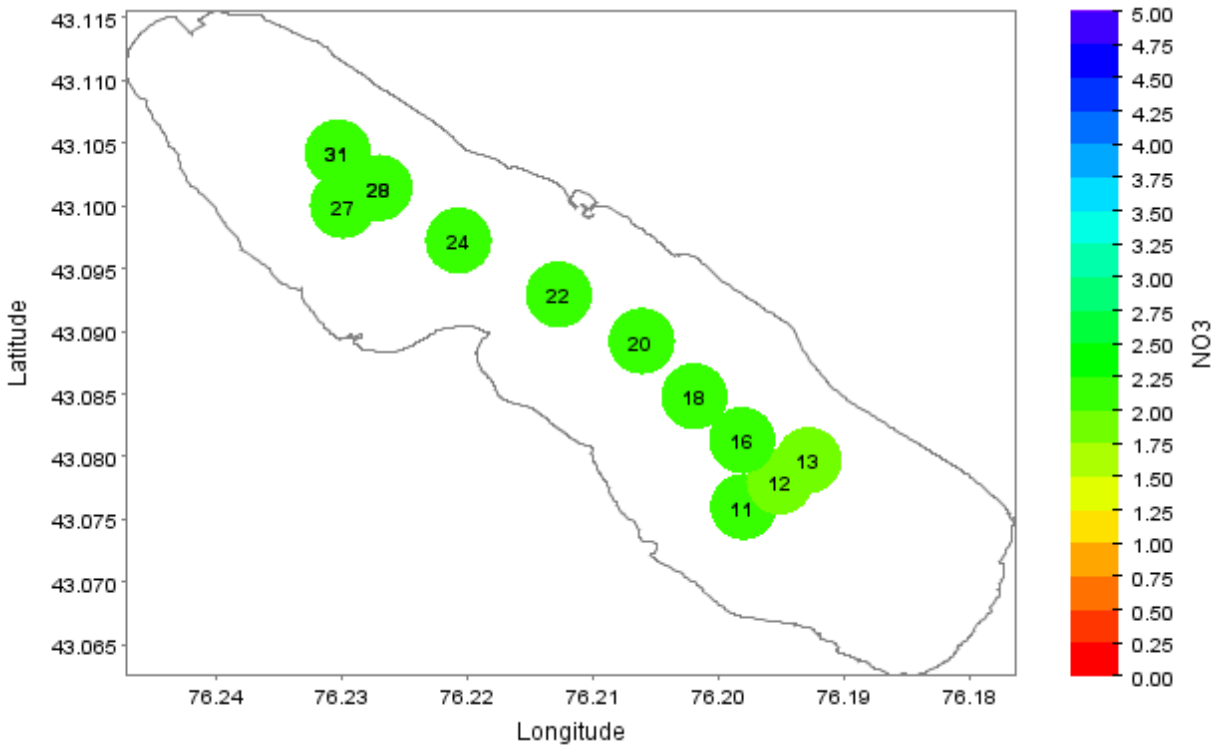
May 20, 2020



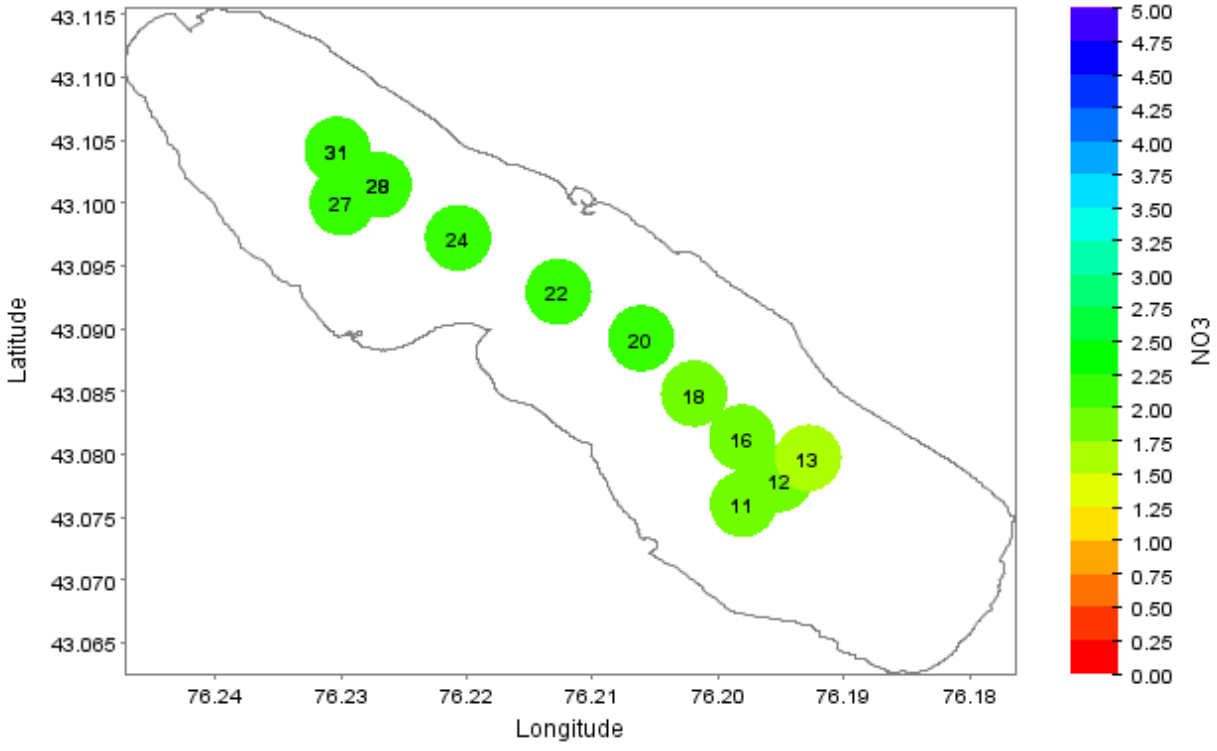
May 26, 2020



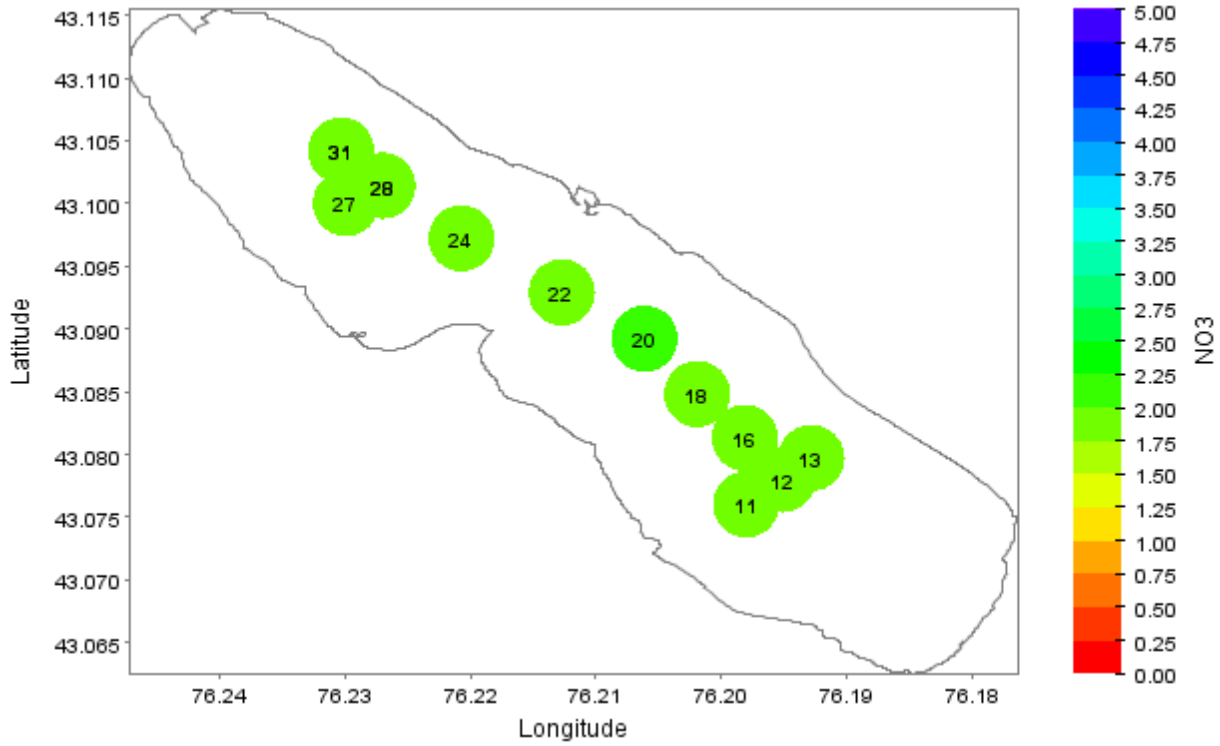
June 01, 2020



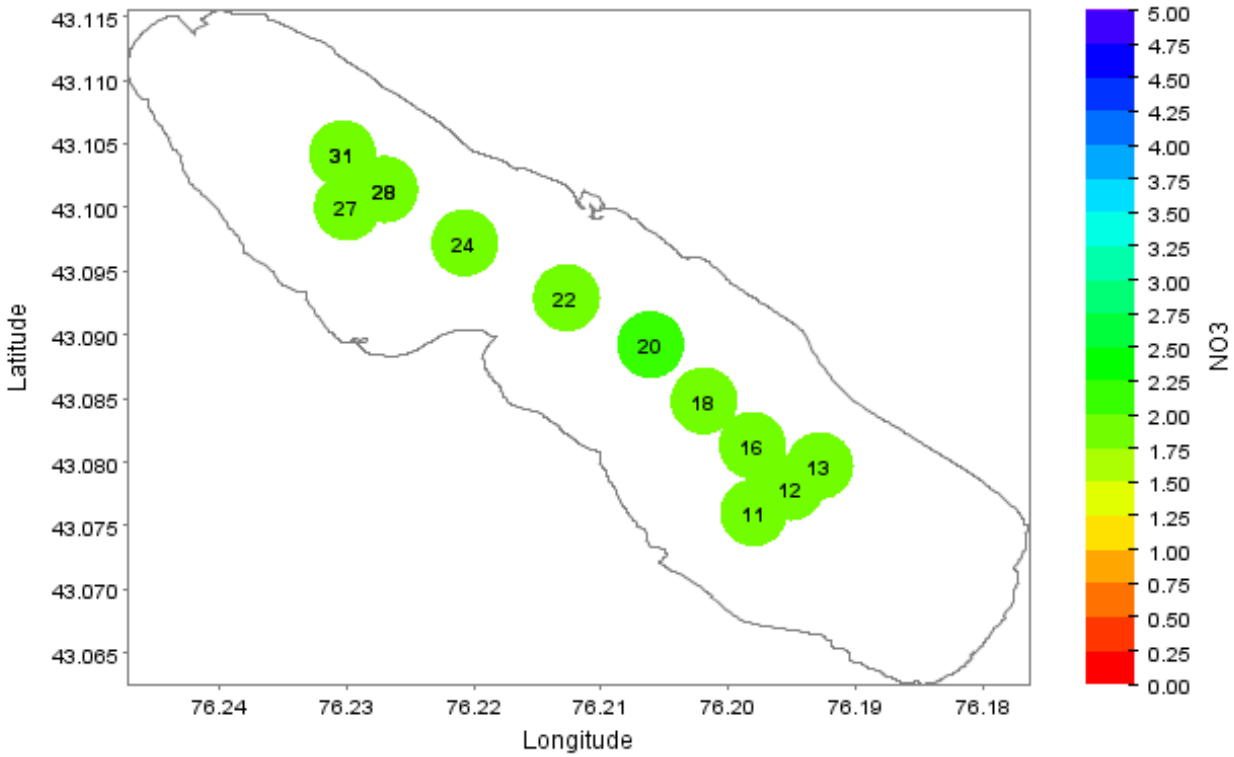
June 08, 2020



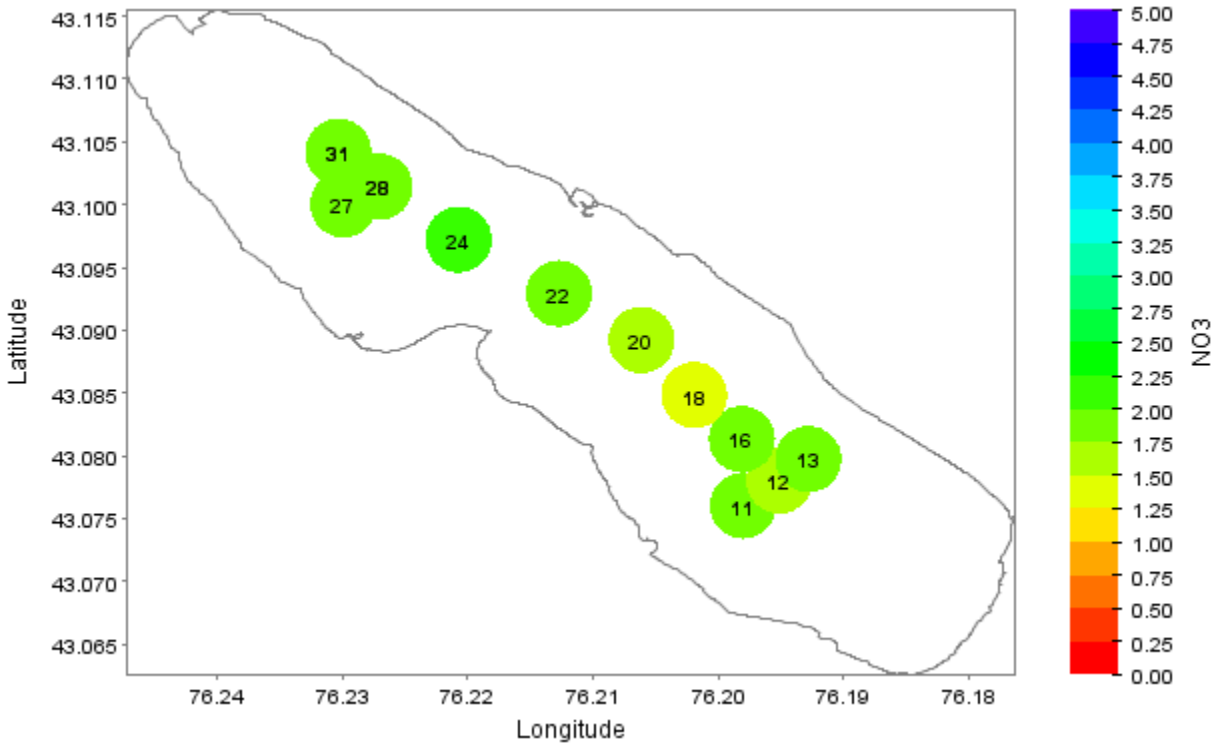
June 15, 2020



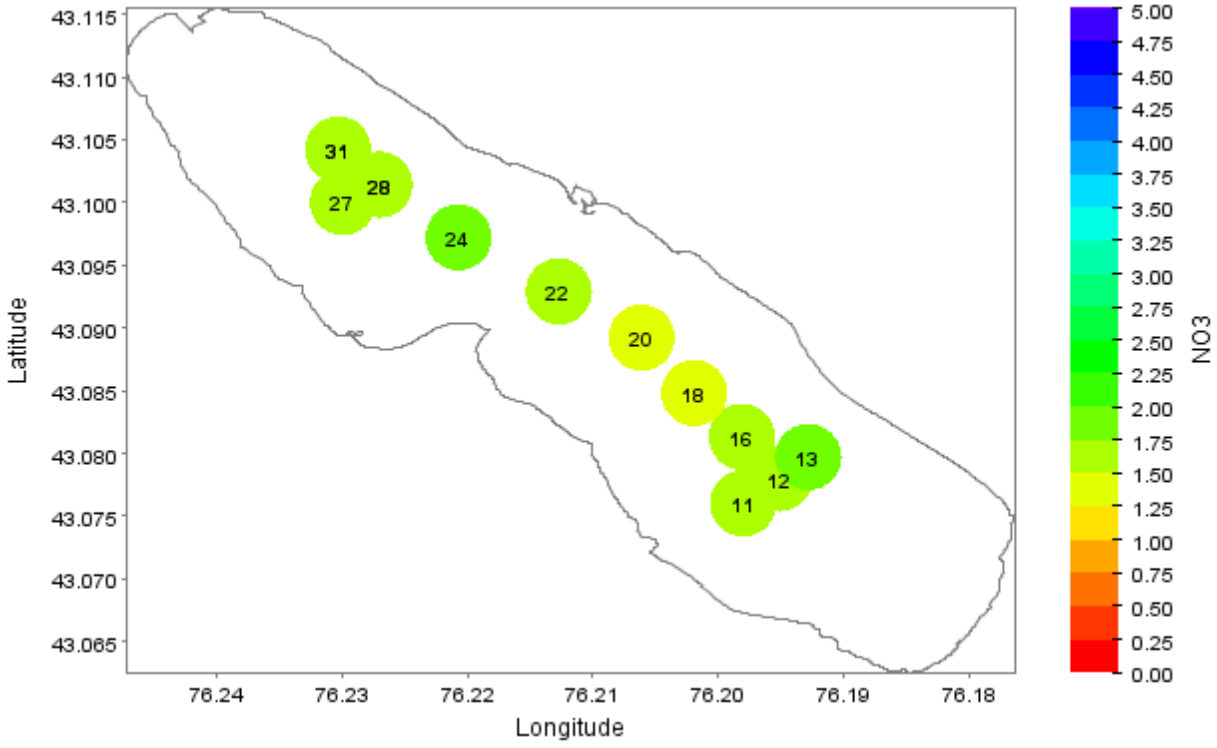
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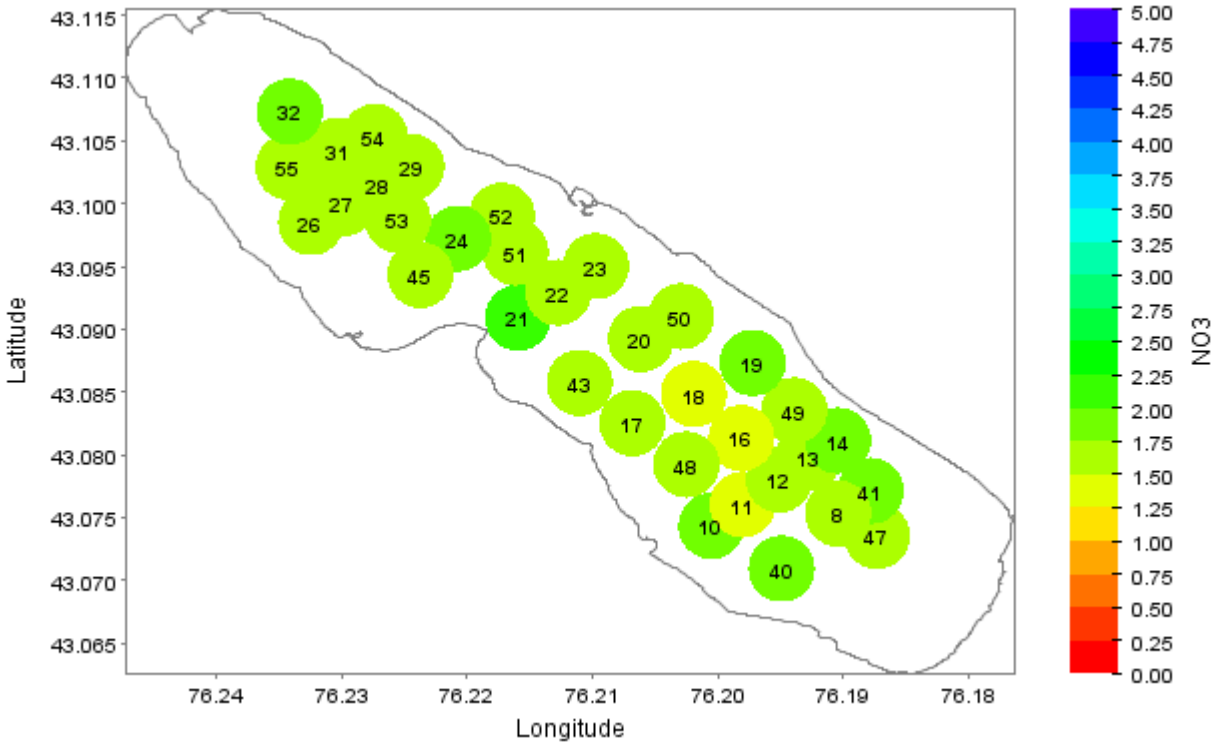
June 22, 2020



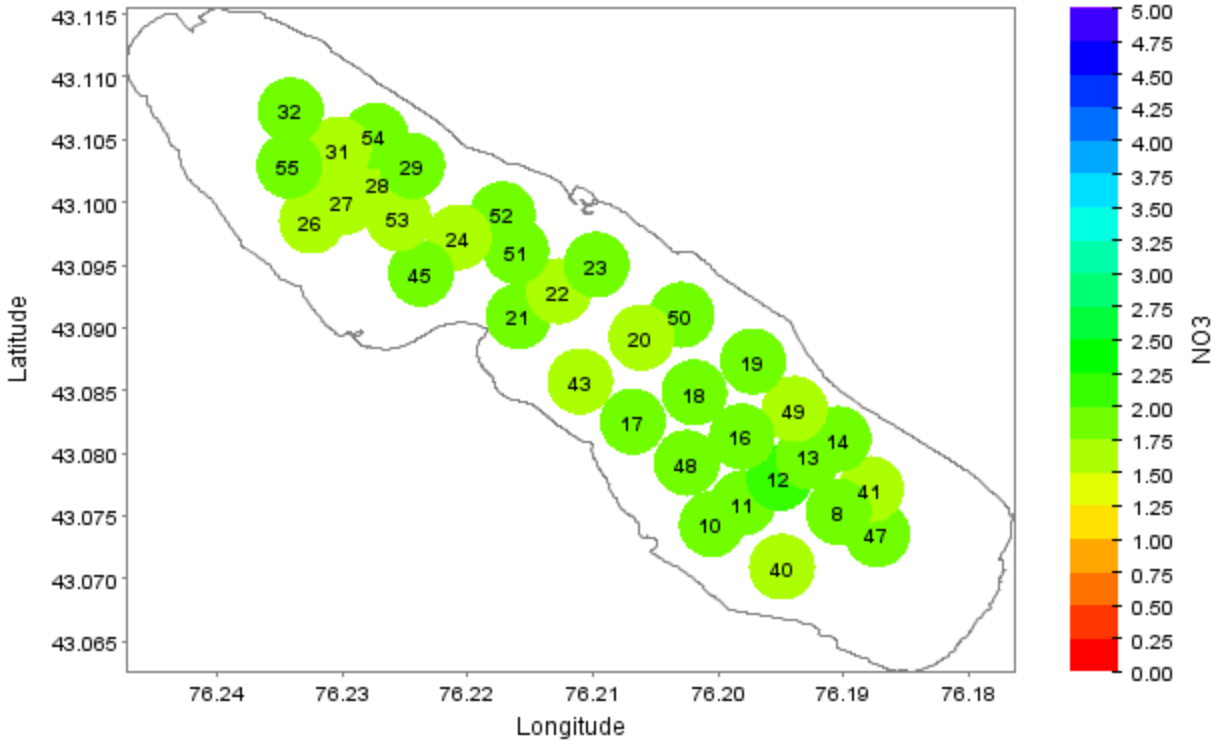
June 29, 2020



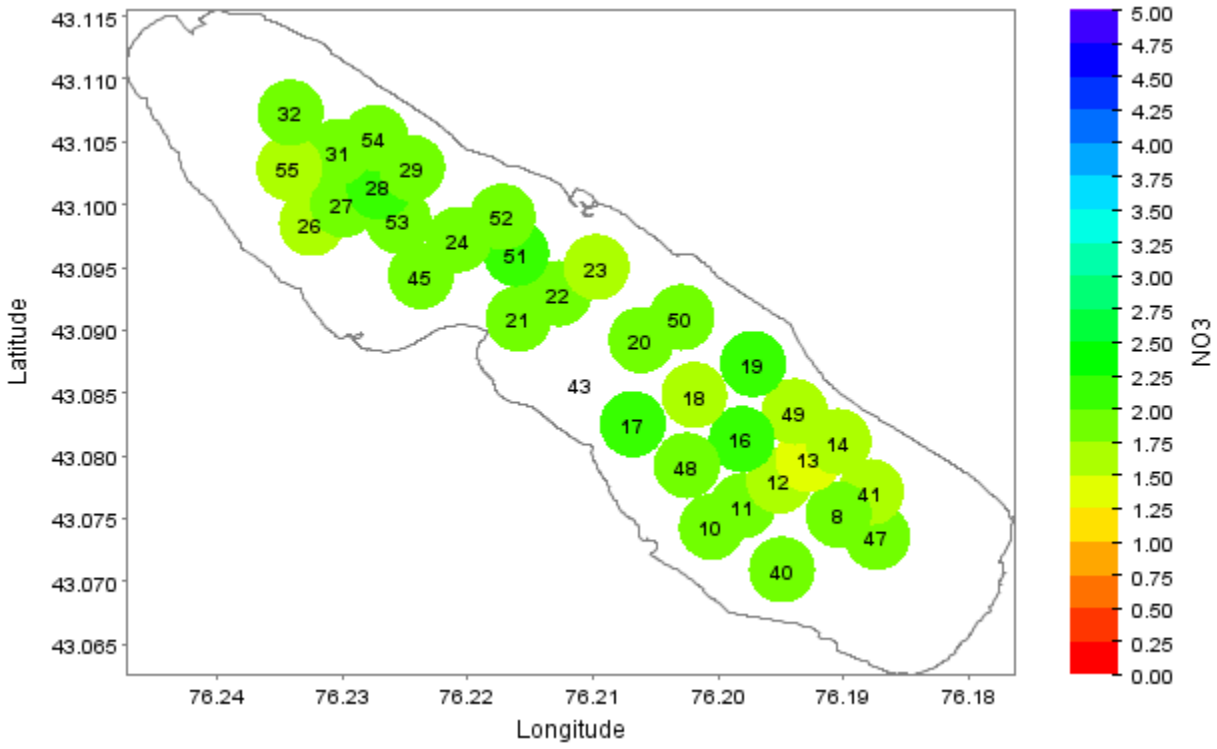
July 07, 2020



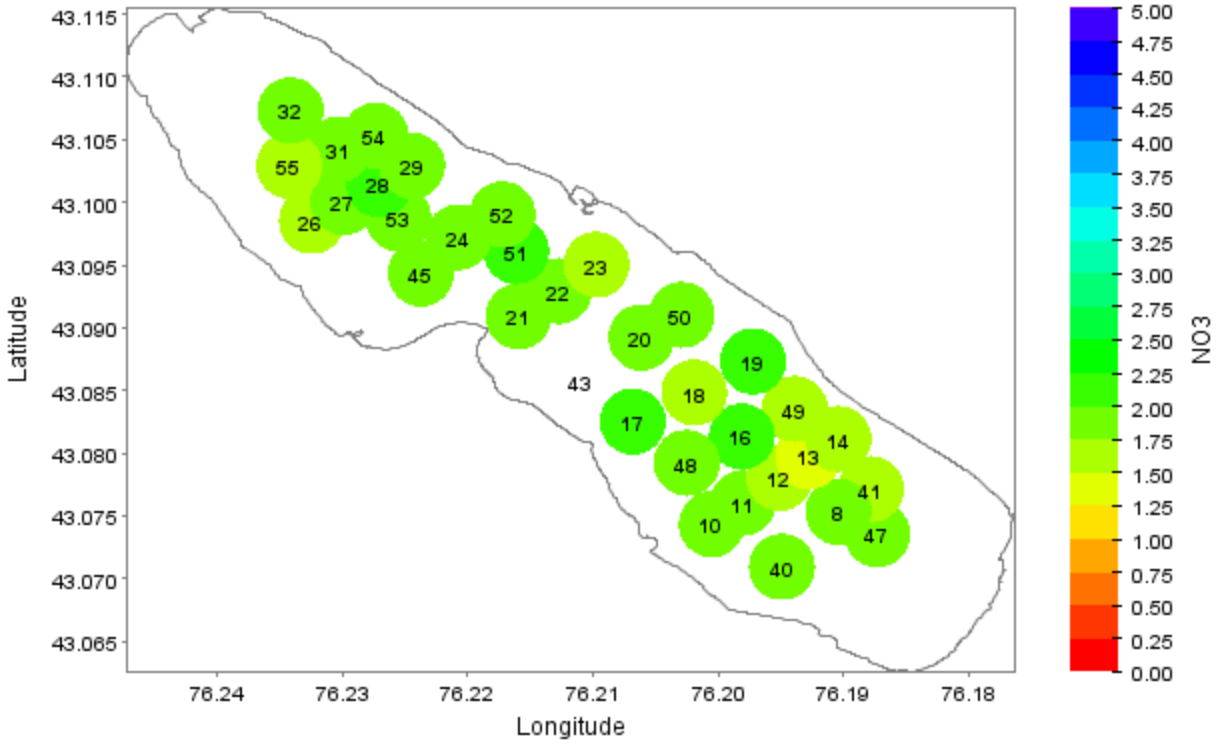
July 13, 2020



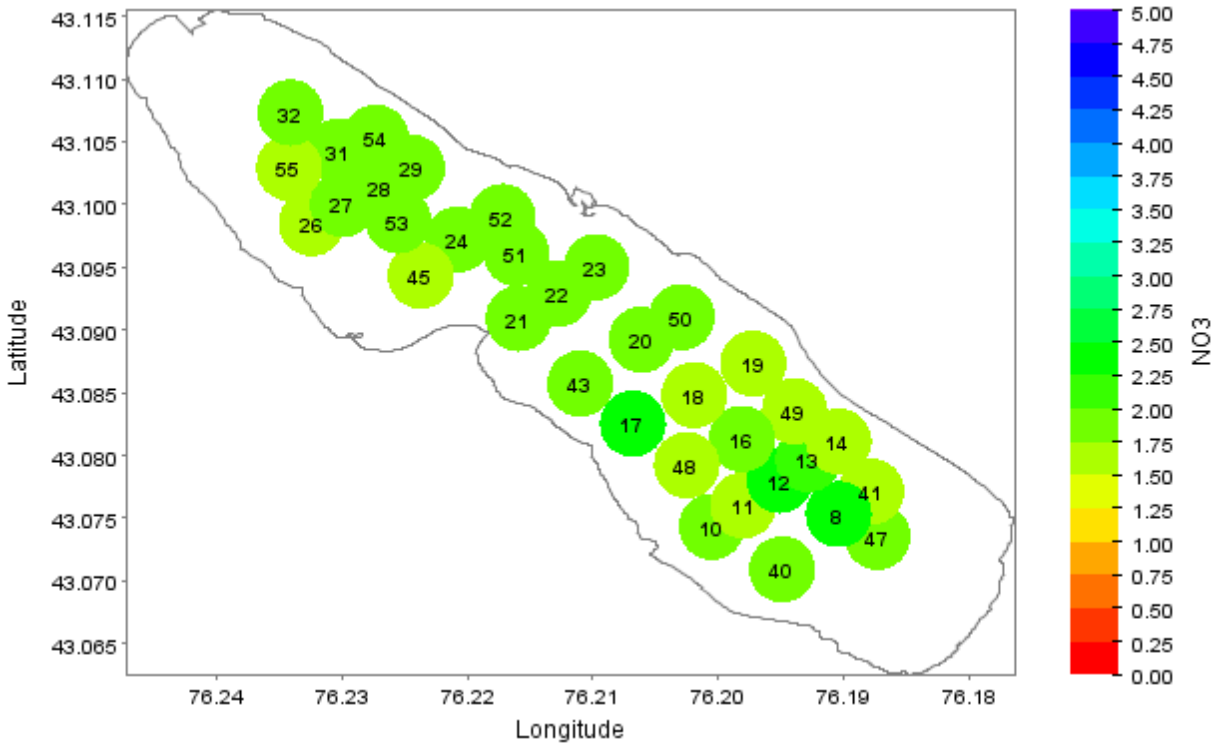
July 20, 2020



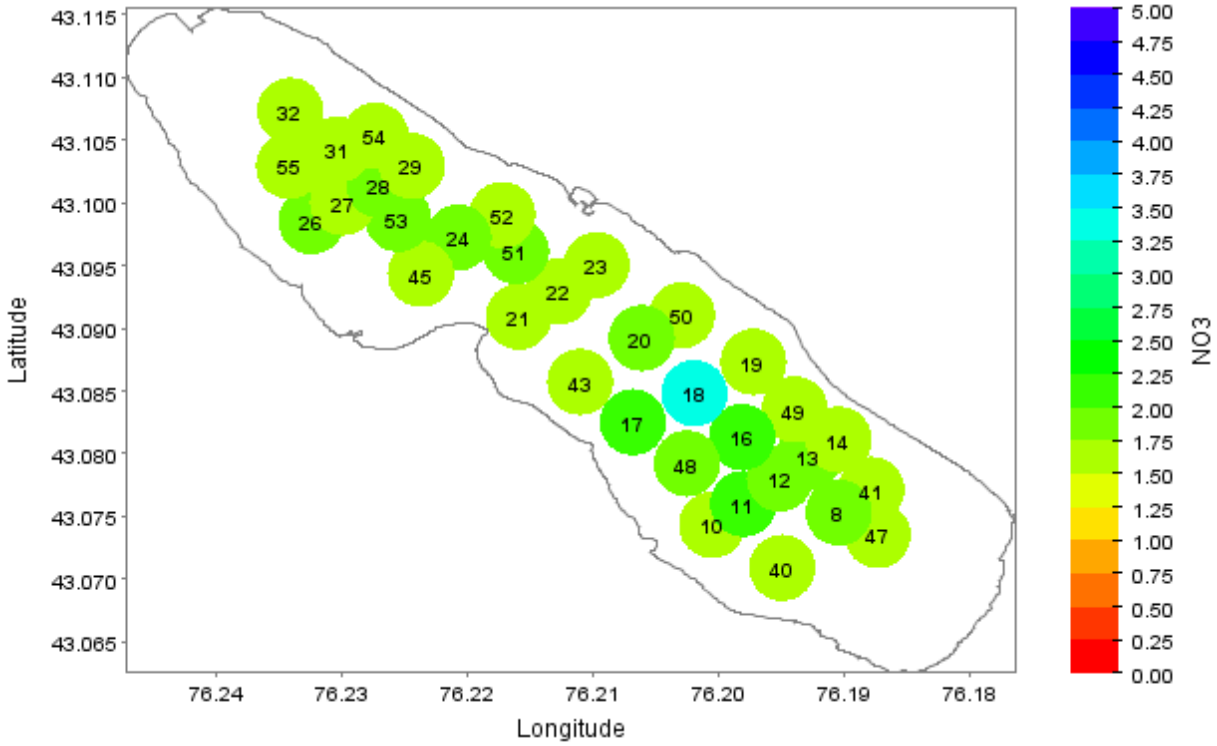
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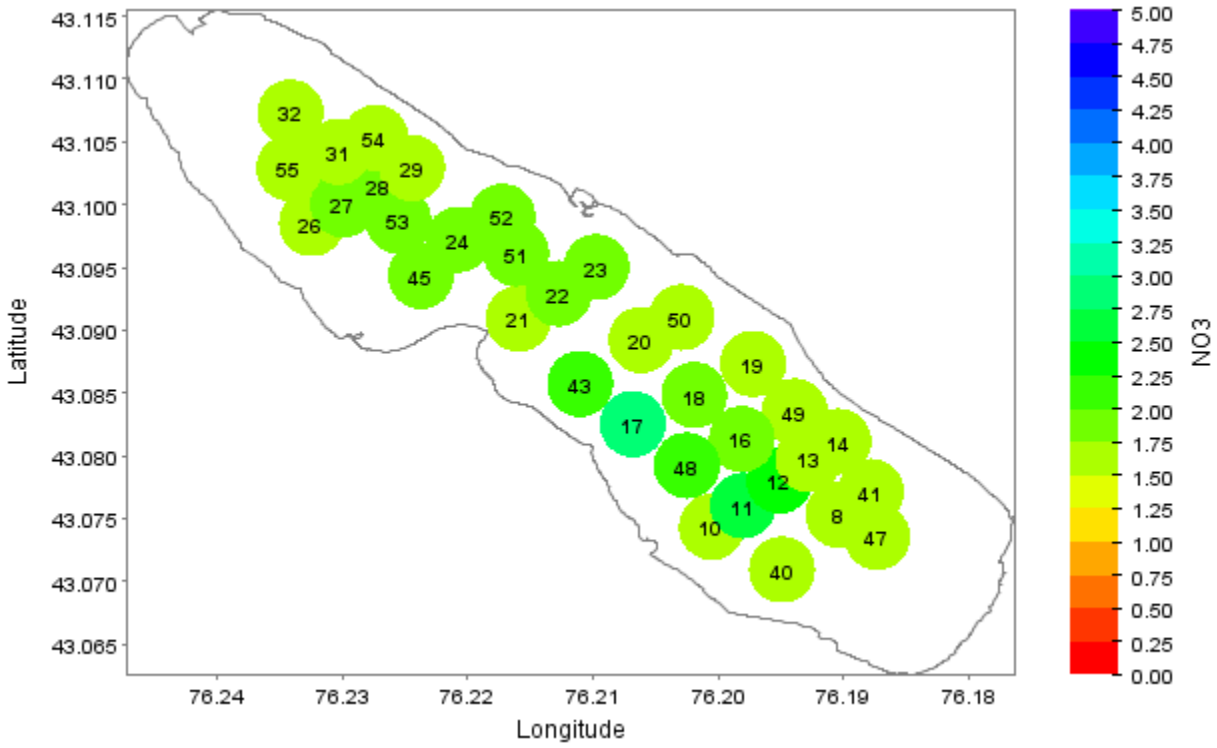
August 03, 2020



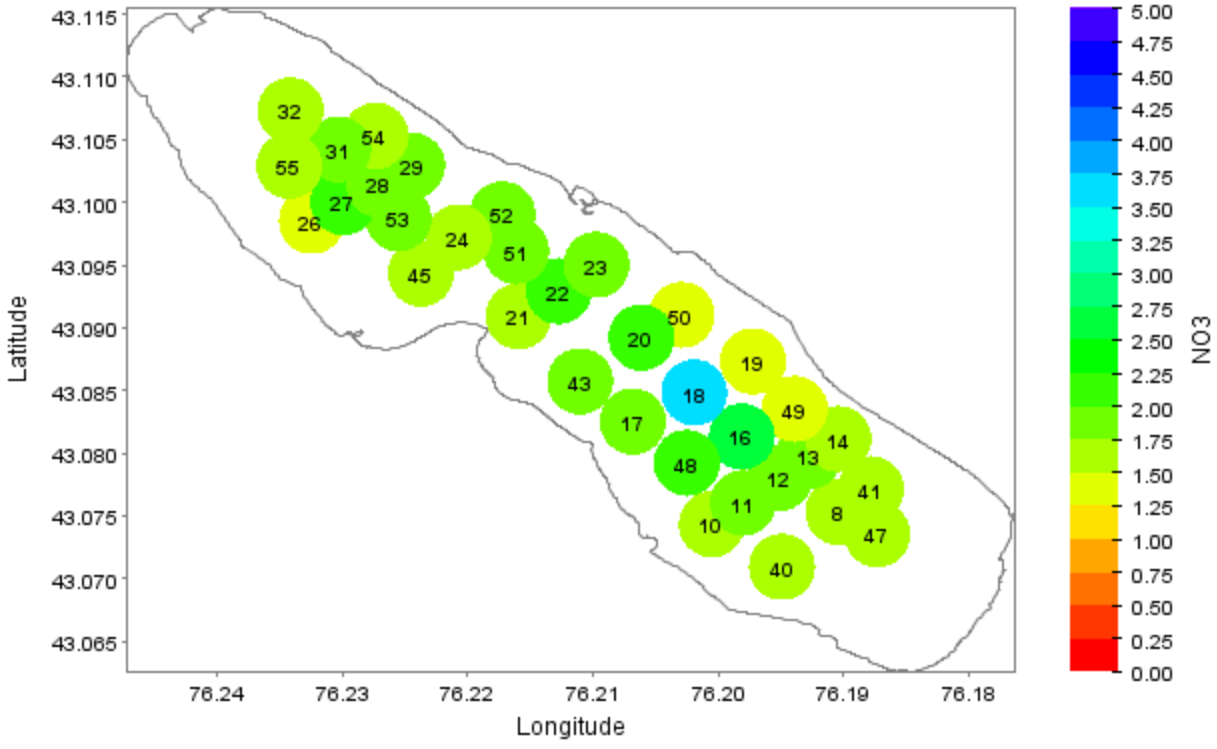
August 10, 2020



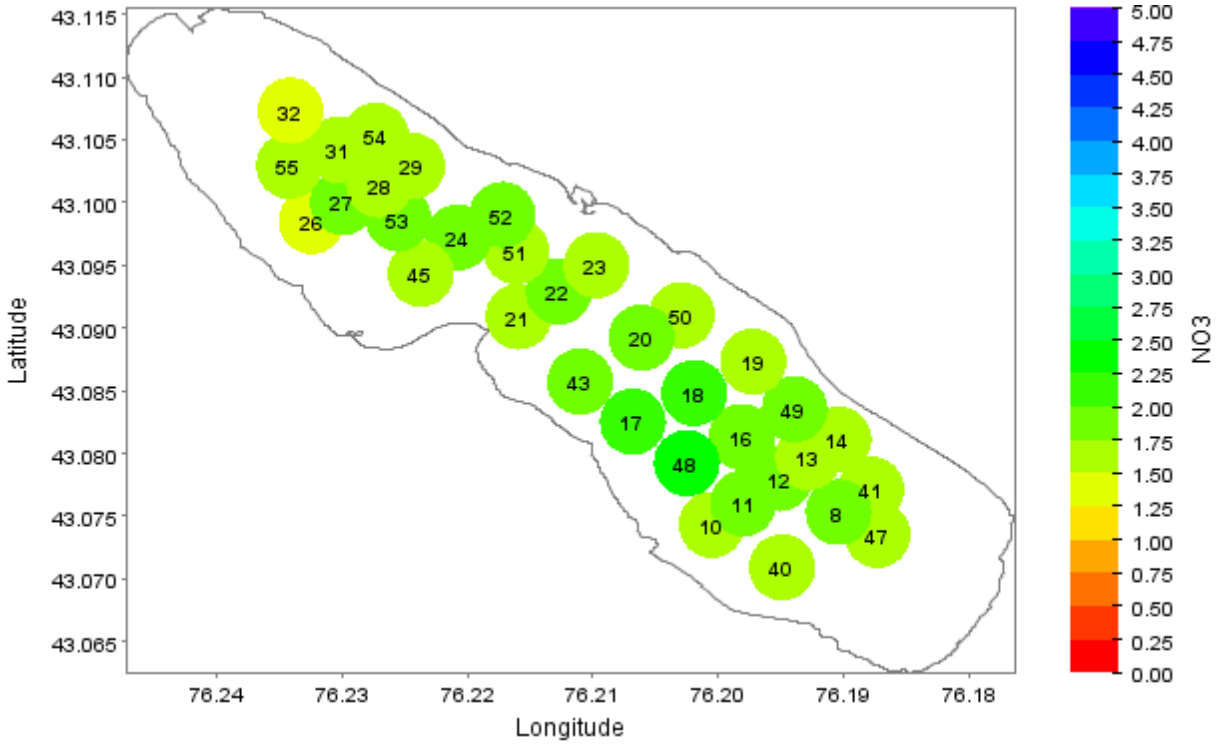
August 17, 2020



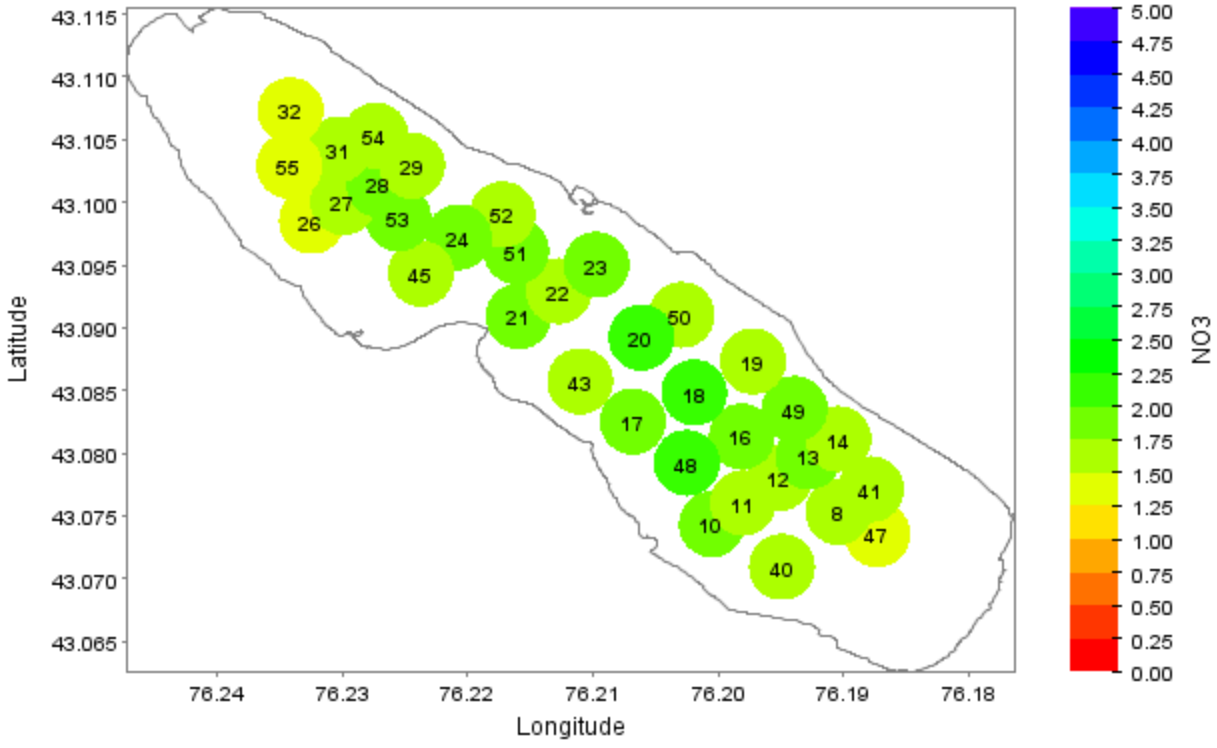
August 24, 2020



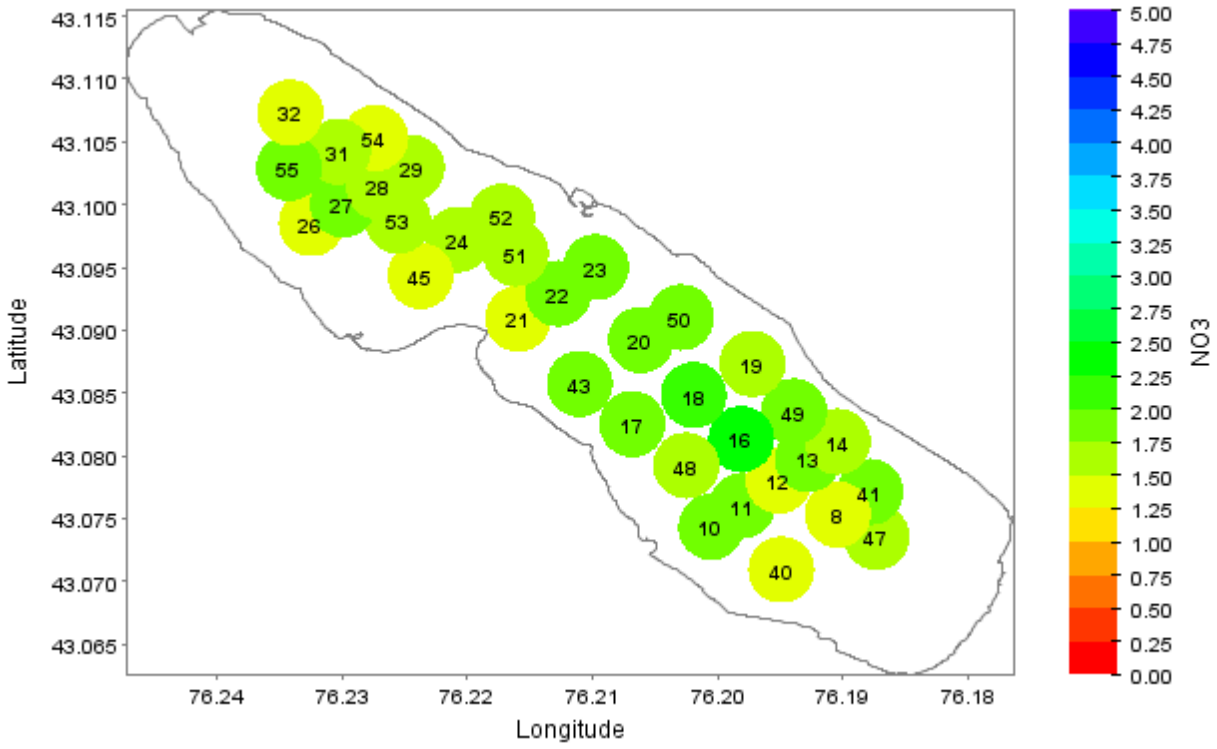
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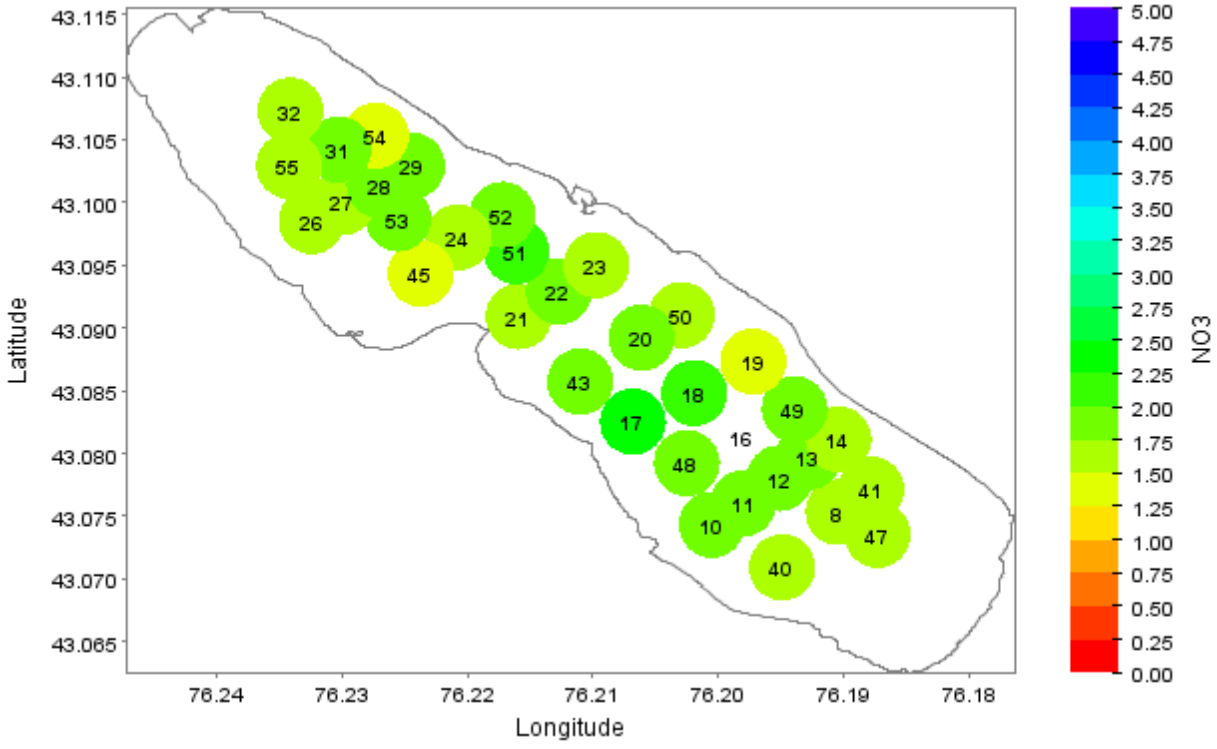
September 08, 2020



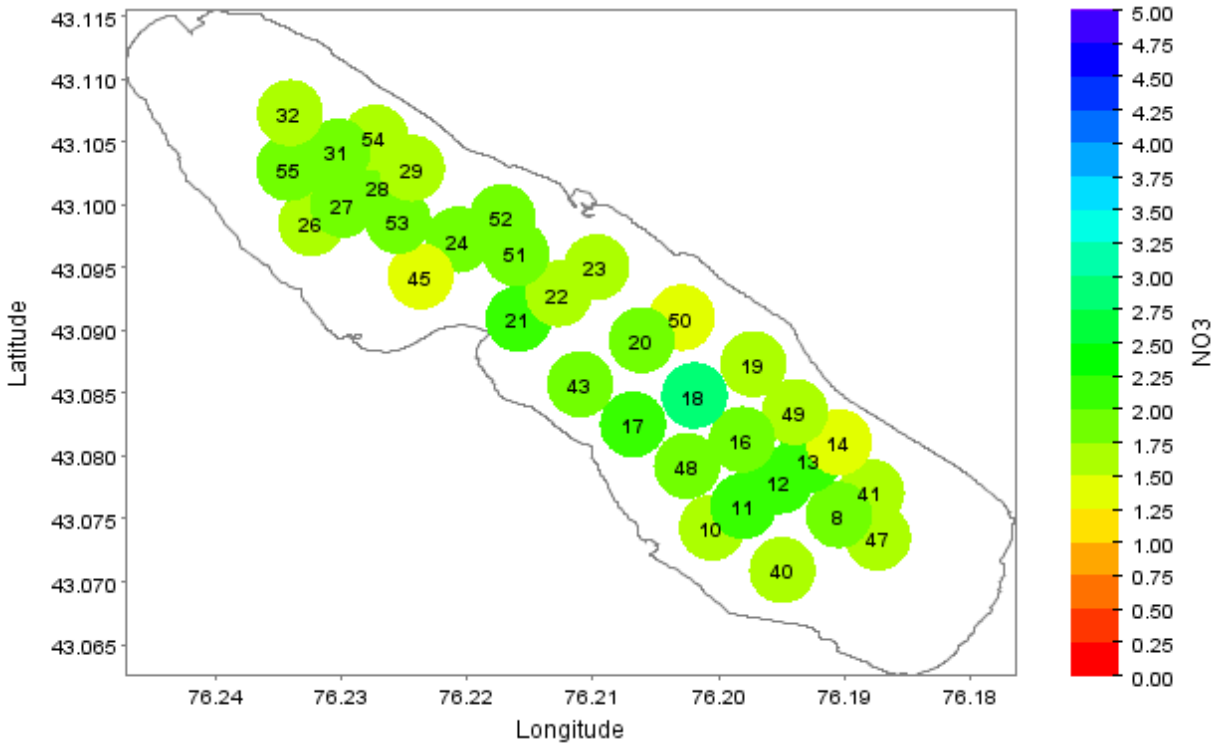
September 14, 2020



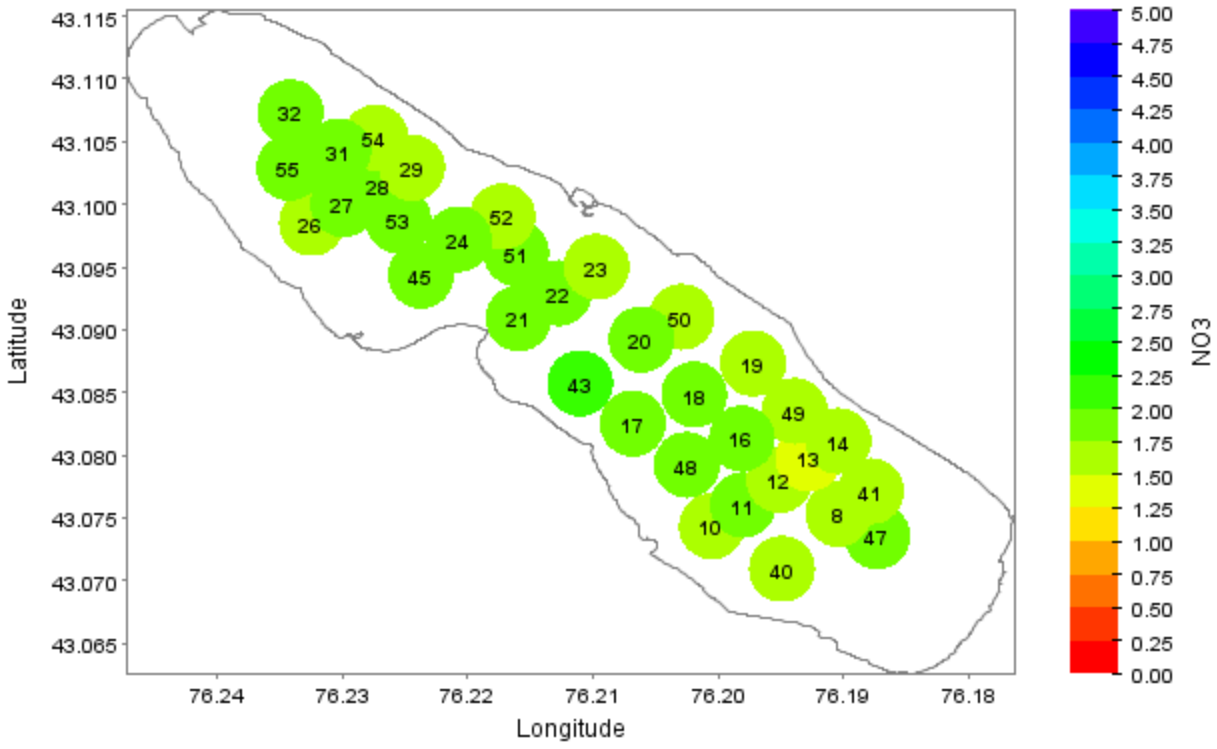
September 21, 2020



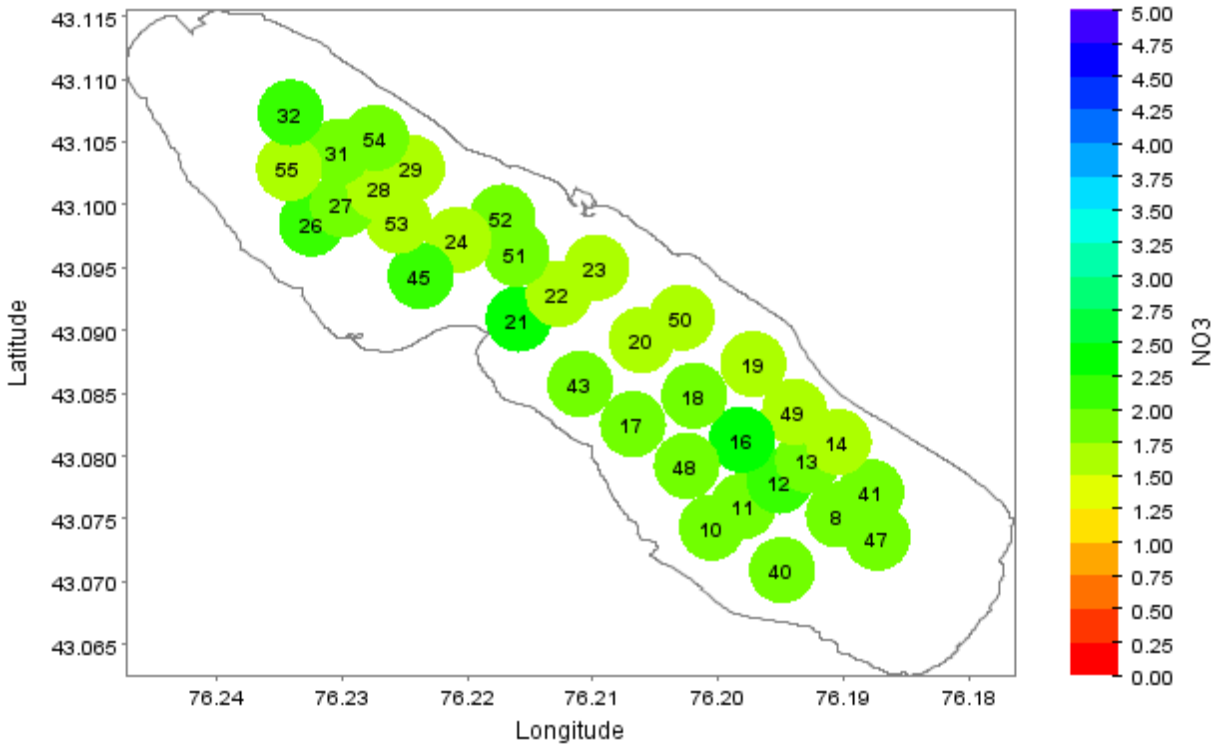
September 28, 2020



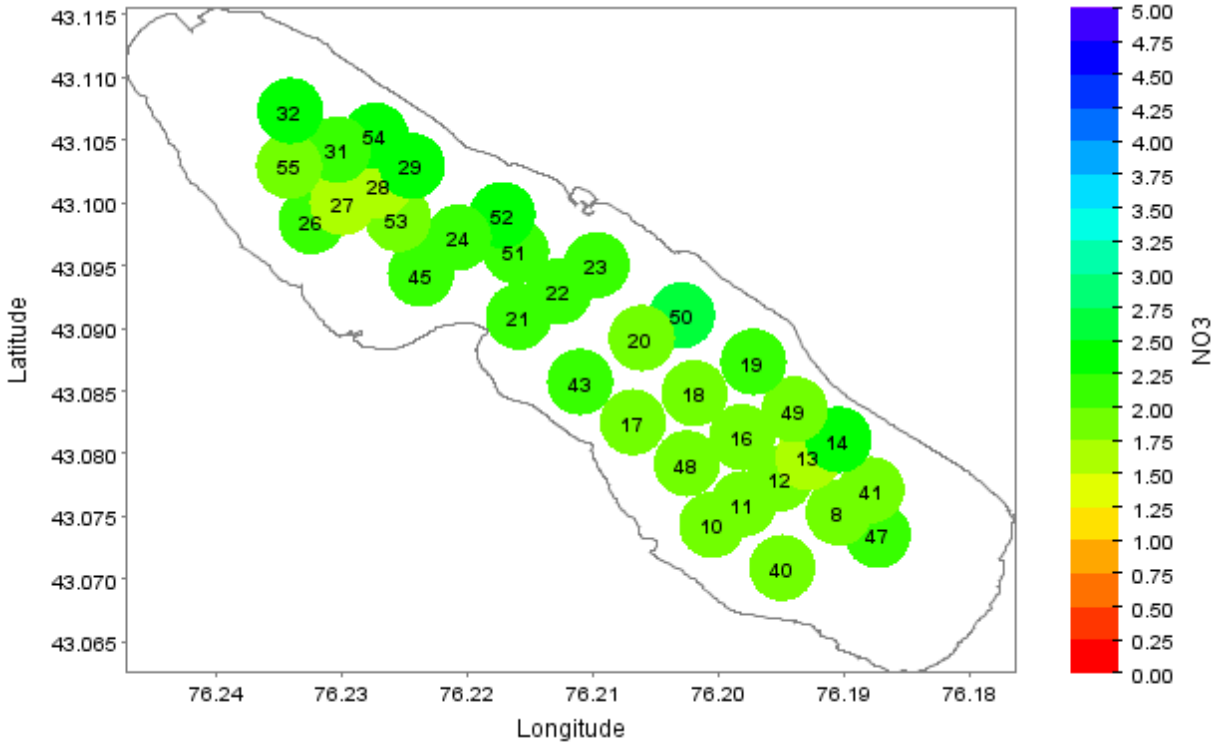
October 05, 2020



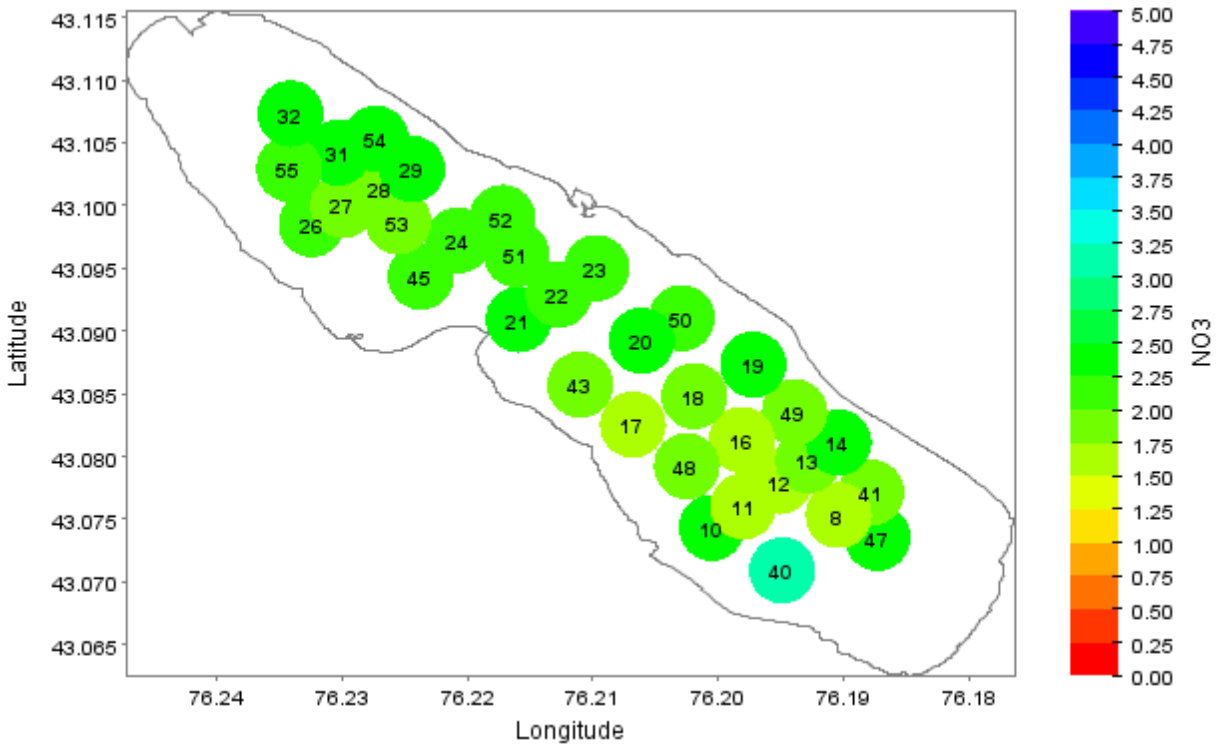
October 12, 2020



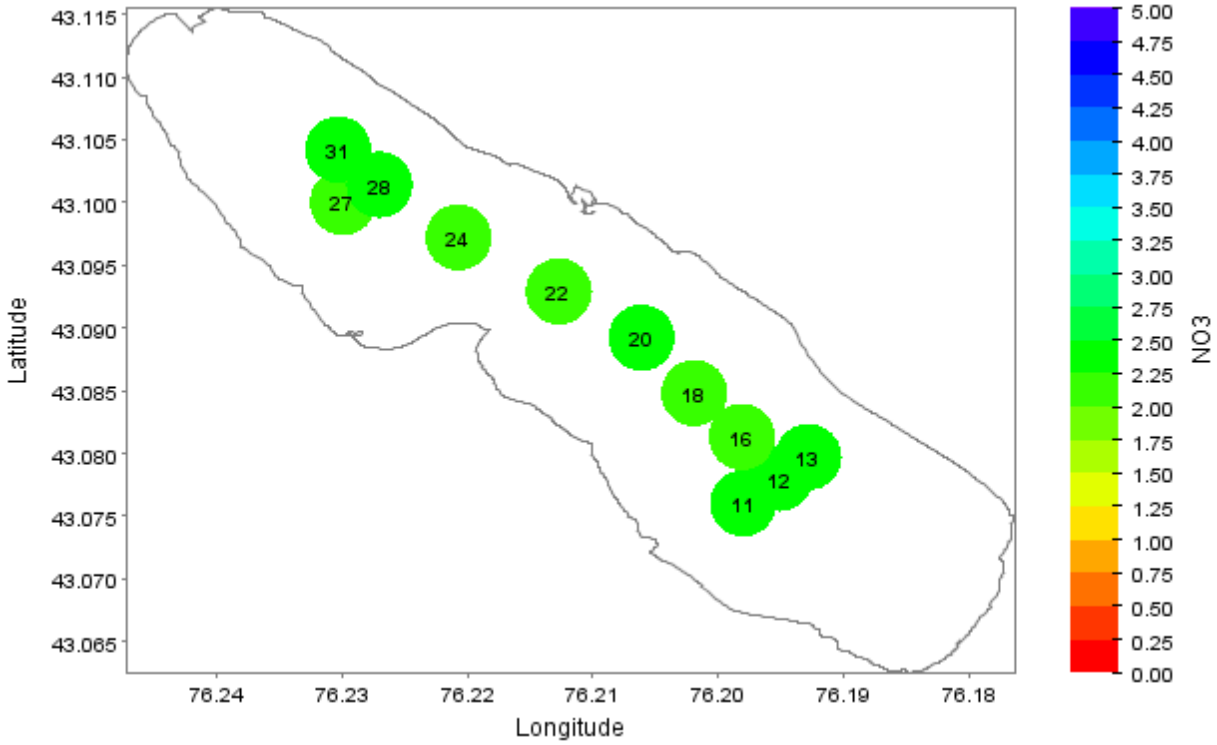
October 19, 2020



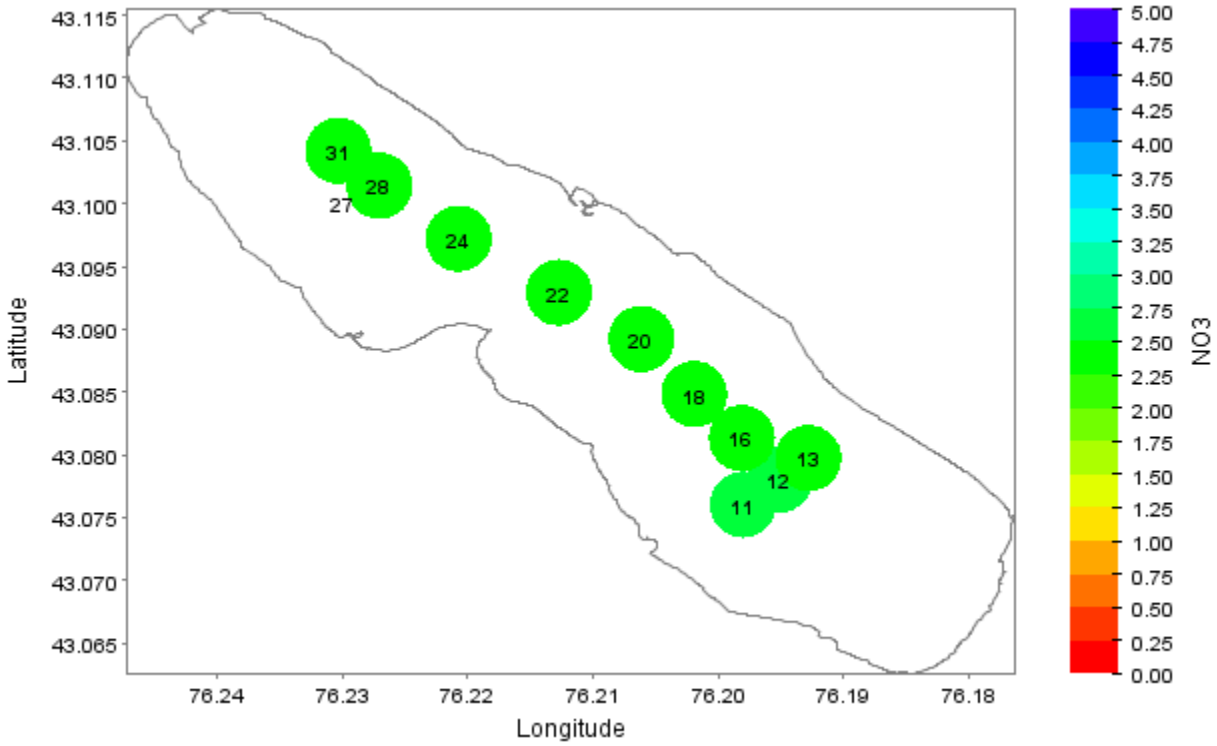
October 26, 2020



November 09, 2020



November 16, 2020



APPENDIX 5D - DATA USABILITY SUMMARY REPORT: ONONDAGA LAKE 2020 SURFACE WATER MONITORING ASSOCIATED WITH NITRATE ADDITION

APPENDIX 5D:

DATA USABILITY SUMMARY REPORT

ONONDAGA LAKE 2020 SURFACE WATER MONITORING ASSOCIATED WITH NITRATE ADDITION ONONDAGA COUNTY, NEW YORK

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JANUARY 2022

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LIST OF ATTACHMENTS

ATTACHMENT A – VALIDATED LABORATORY DATA

SECTION 5D1 DATA USABILITY SUMMARY

Surface water samples were collected as part of the 2020 nitrate addition sampling in the hypolimnion efforts for Onondaga Lake from May 12, 2020 through November 18, 2020. Analytical results from these samples were validated and reviewed by Parsons for usability with respect to the following requirements:

- Operations and Monitoring Plan for Adding Nitrate Full Scale to the Hypolimnion of Onondaga Lake (Parsons and UFI);
- Quality Assurance Project Plan (QAPP) for Onondaga Lake Construction and Post-Construction Media Monitoring (Surface Water, Biota and Sediment) (Parsons. Anchor QEA and Upstate Freshwater Institute [UFI]); and
- USEPA Region II Standard Operating Procedures (SOPs) for inorganic data review (see Section 5D2 for citations).

Upstate Freshwater Institute (UFI) in Syracuse, New York collected all the samples reported herein.

The analytical laboratories for this project were Eurofins – Frontier and UFI. These laboratories are certified by the State of New York to conduct laboratory analyses for this project through the National Environmental Laboratory Accreditation Conference (NELAC) and the New State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP).

5D1.1 Laboratory Data Packages

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 6 to 54 days for the samples.

The data packages received from the laboratories were paginated, complete, and overall were of good quality. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation report which is summarized by sample media in Section 5D2.

5D1.2 Sampling and Chain-of-Custody

The samples were collected, shipped under a chain-of-custody (COC) record, and received at the laboratories within one to three days of sampling. All samples were received intact and in good condition at the laboratories.

5D1.3 Laboratory Analytical Methods

The surface water samples were collected from the site and analyzed for total and/or dissolved low level mercury, methyl mercury, nitrite, nitrate-nitrite, reactive phosphate, and/or ammonia. Summaries of deviations from the Work Plan, QAPP, or USEPA Region II SOPs concerning these laboratory analyses are presented in Subsections 5D1.3.1 through 5D1.3.3. The data qualifications resulting from the data validation review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are discussed for each analytical method by media in Section 5D2. The laboratory data were reviewed and may be qualified with the following validation flags:

"U" - not detected at the value given
"UJ" - estimated and not detected at the value given
"J" - estimated at the value given
"J+" - estimated biased high at the value given
"J-" - estimated biased low at the value given
"N" - presumptive evidence at the value given
"R" - unusable value

The validated laboratory data were tabulated and are presented in Attachment A.

5D1.3.1 Low Level Mercury Analysis

Surface water sample results reported herein were analyzed by Eurofins for low level mercury using the USEPA 1631E analytical method. Certain reported results for the low level mercury samples were considered estimated based upon field duplicate precision and dissolved mercury significantly higher than total mercury. The reported low level mercury analytical results were considered 100% complete (i.e., usable) for the data presented by Eurofins. PARCCS requirements were met.

5D1.3.2 Methyl Mercury Analysis

Surface water sample results reported herein were analyzed by Eurofins for methyl mercury using the USEPA 1630 analytical method. Certain reported results for the methyl mercury samples were qualified as estimated based upon matrix spike recoveries and field duplicate precision. The reported methyl mercury analytical results were considered 100% complete (i.e., usable) for the data presented by Eurofins. PARCCS requirements were met.

5D1.3.3 Other Surface Water Analyses

Surface water sample results for other parameters reported herein were analyzed by UFI for nitrite, nitrate-nitrite, reactive phosphate, and/or ammonia using the SM4500 analytical method. Certain reported results for these parameters were qualified as estimated based upon holding times, matrix spike recoveries, laboratory duplicate precision, and field duplicate precision. The reported analytical results for these parameters were considered 100% complete (i.e., usable) for the data presented by UFI. PARCCS requirements were met.

SECTION 5D2 DATA VALIDATION REPORT

5D2.1 Surface Water Samples

Data review has been completed for data packages generated by Eurofins and UFI containing surface water sample results collected from the site. The specific samples contained in these data packages, the analyses performed, and the validated laboratory data were tabulated and are presented in Attachment A. All of these samples were shipped under a COC record and received intact by the analytical laboratory.

Data validation was performed for all samples in accordance with the project work plan and QAPP as well as the USEPA Region II SOP HW-2c, Revision 15 "Mercury and Cyanide Data Validation". This data validation and usability report is presented by analysis type.

5D2.1.1 Total and Dissolved Low Level Mercury

The following items were reviewed for compliancy in the low level mercury analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration verifications
- Initial and continuing calibration, laboratory preparation blank, and field blank contamination
- Matrix spike / matrix spike duplicate (MS/MSD) recoveries
- Laboratory duplicate precision
- Laboratory control sample (LCS) recoveries
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination and field duplicate precision as discussed below.

Blank Contamination

Field blanks and equipment blanks associated with project samples contained total mercury at a concentration ranging 0.09-2.79 ng/L; laboratory preparation blanks associated with project samples contained total mercury at a concentration ranging 0.08-0.85 ng/L; laboratory initial calibration blanks associated with project samples contained total mercury at a concentration ranging 0.01-0.40 ng/L; and laboratory continuing calibration blanks associated with project samples contained total mercury at a concentration ranging 0.001-1.97 ng/L. Therefore, associated total mercury results less than validation action concentrations were considered not detected and qualified "U" for the affected samples.

It should be noted that field blanks and equipment blanks are not analyzed for dissolved mercury and do not have filter blanks associated with them.

Field Duplicate Precision

All field duplicate precision results were considered acceptable with the exception of the precision for total mercury associated with the parent samples/field duplicate samples OL-3503-01/-02 (101%RPD), OL-3515-

01/-02 (113%RPD), OL-3519-01/-02 (58%RPD), and OL-3580-01/-02 (67%RPD). Therefore, the total mercury results for were considered estimated and qualified "J" for the affected parent samples and field duplicates.

Usability

All total and dissolved mercury sample results were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The total and dissolved low level mercury data presented by Eurofins were 100% complete (i.e., usable). The validated low level mercury laboratory data are tabulated and presented in Attachment A.

It was noted that dissolved mercury was significantly higher than total mercury for samples OL-3515-01, OL-3529-01, and OL-3560-04. Mercury results were considered estimated and qualified "J" for the affected samples.

5D2.1.2 Methyl Mercury

The following items were reviewed for compliancy in the methyl mercury analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Initial and continuing calibration verifications
- Initial and continuing calibration, laboratory preparation blank, and field blank contamination
- Matrix spike / matrix spike duplicate (MS/MSD) recoveries
- Laboratory duplicate precision
- Laboratory control sample (LCS) recoveries
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination, matrix spike recoveries, and field duplicate precision as discussed below.

Blank Contamination

The laboratory initial calibration blanks associated with project samples contained methyl mercury at a concentration ranging 0.007-0.037 ng/L; laboratory continuing calibration blanks associated with project samples contained methyl mercury at a concentration ranging 0.0004-0.042 ng/L; laboratory preparation blanks associated with project samples contained methyl mercury at a concentration ranging 0.028-0.074 ng/L; and field and equipment blanks associated with project samples contained methyl mercury at a concentration ranging 0.041-0.076 ng/L. Therefore, methyl mercury results less than validation action concentrations were considered not detected and qualified "U" for the affected samples.

Matrix Spike Recoveries

All matrix spike recoveries were considered acceptable and within the 65-130%R QC limit with the exception of the matrix spike recoveries for methyl mercury associated with samples OL-3522-04 (18.4%R, 24.3%R) and OL-3556-03 (132%R). Therefore, methyl mercury results where matrix spike recoveries fell below the QC limit were considered estimated with positive results qualified "J" and nondetected results qualified "UJ" for the affected

samples. Positive methyl mercury results where matrix spike recoveries exceeded the QC limit were considered estimated and qualified "J" for the affected samples.

Field Duplicate Precision

All field duplicate precision results were considered acceptable with the exception of the precision for methyl mercury associated with the parent samples/field duplicate samples OL-3522-01/-02 (nondetect/0.056 ng/L) and OL-3552-01/-02 (68%RPD). Therefore, the methyl mercury results were considered estimated with positive results qualified "J" and nondetected results qualified "UJ" for the affected parent sample and field duplicate.

Usability

All methyl mercury sample results were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The methyl mercury data presented by Eurofins were 100% complete (i.e., usable). The validated methyl mercury laboratory data are tabulated and presented in Attachment A.

5D2.1.3 Nitrite, Nitrate-Nitrite, Reactive Phosphate, and Ammonia

All custody documentation, holding times, matrix spike recoveries, laboratory duplicate precision, laboratory control sample recoveries, laboratory method blank contamination, QC field blank contamination, initial and continuing calibration verifications, field duplicate precision, and quantitation limits were reviewed for compliance. Validation qualification of the sample results for these parameters was not required with the exception of the following:

- Ammonia results for sample OL-3500-01 and its field duplicate OL-3500-02 were considered estimated and qualified "J" based upon poor field duplicate precision (75%RPD).
- Ammonia results for sample OL-3516-01 and its field duplicate OL-3516-02 were considered estimated and qualified "J" based upon poor field duplicate precision (53%RPD).
- Ammonia results for sample OL-3530-01 and its field duplicate OL-3530-02 were considered estimated and qualified "J" based upon poor field duplicate precision (43%RPD).
- Ammonia results for sample OL-3534-01 and its field duplicate OL-3534-02 were considered estimated and qualified "J" based upon poor field duplicate precision (88%RPD).
- The ammonia result for sample OL-3516-02 was considered estimated and qualified "J" based upon a low matrix spike recovery (84%R; QC limit 85-115%R).
- Nitrate-nitrite results for samples OL-3530-01, -02, -03, -05, -06, and -08 were considered estimated and qualified "J" based upon the exceedance of the 28-day holding time criteria by three days.
- The nitrite result for sample OL-3553-06 was considered estimated and qualified "J" based upon poor laboratory duplicate precision (25.5%RPD; QC limit 0-20%RPD).
- Ammonia results for samples collected on 6/16/20 and 9/1/20 that were less than validation action concentrations were considered not detected and qualified "U" based upon field blank contamination (65 and 96 µg/L, respectively).

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The data for these parameters presented by UFI were 100% complete (i.e., usable). The validated laboratory data are tabulated and presented in Attachment A.

ATTACHMENT A – VALIDATED LABORATORY DATA

Onondaga Lake
2020 Nitrate Addition - Surface Water

							Parameter	MERCURY		MERCURY		METHYL MERCURY		NITRITE		NITROGEN, AMMONIA (AS N)		NITROGEN, NITRATE-NITRITE		REACTIVE PHOSPHATE	
							Method	E1631		E1631		E1630		E353.2		E350.1		E353.2		SM4500P-E	
							Filtered	T		D		T		T		T		T		T	
							Units	ug/l		ug/l		ug/l		mg/L		mg/L		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type														
DEEP_S	OL-3500-01	6.6 - 6.6	05/12/2020	UFI CHM 2020-021	Water	REG	SW							0.0176		0.016	J	2.3			
DEEP_S	OL-3500-02	6.6 - 6.6	05/12/2020	UFI CHM 2020-021	Water	FD	SW							0.0188		0.035	J	2.3			
DEEP_S	OL-3500-03	39.6 - 39.6	05/12/2020	UFI CHM 2020-021	Water	REG	SW							0.018		0.015	J	2.3			
DEEP_S	OL-3500-04	59.4 - 59.4	05/12/2020	UFI CHM 2020-021	Water	REG	SW							0.018		0.021	J	2.3			
QC	OL-3500-05		05/12/2020	UFI CHM 2020-021	Water	FB	WQ							0.006	U	0.03	U	0.03	U		
DEEP_S	OL-3503-01	6.6 - 6.6	05/12/2020	0E00055	Water	REG	SW	0.00392	J	0.00179		0.00003	J								
DEEP_S	OL-3503-02	6.6 - 6.6	05/12/2020	0E00055	Water	FD	SW	0.00129	J			0.000026	U								
DEEP_S	OL-3503-03	39.6 - 39.6	05/12/2020	0E00055	Water	REG	SW	0.00131				0.000026	U								
DEEP_S	OL-3503-04	59.4 - 59.4	05/12/2020	0E00055	Water	REG	SW	0.00146				0.000027	J								
QC	OL-3503-05		05/12/2020	0E00055	Water	FB	WQ	0.00008	U			0.000026	U								
QC	OL-3503-06		05/11/2020	0E00055	Water	EB	WQ	0.00008	U			0.000026	U								
DEEP_S	OL-3508-01	6.6 - 6.6	06/16/2020	UFI CHM 2020-040	Water	REG	SW							0.0229		0.0362	U	2.95			
DEEP_S	OL-3508-02	6.6 - 6.6	06/16/2020	UFI CHM 2020-040	Water	FD	SW							0.0239		0.033	U	3			
DEEP_S	OL-3508-03	39.6 - 39.6	06/16/2020	UFI CHM 2020-040	Water	REG	SW							0.0227		0.154		2.24			
DEEP_S	OL-3508-04	59.4 - 59.4	06/16/2020	UFI CHM 2020-040	Water	REG	SW							0.0352		0.362		1.95			
QC	OL-3508-05		06/16/2020	UFI CHM 2020-040	Water	FB	WQ							0.006	U	0.065		0.03	U		
DEEP_S	OL-3511-01	6.6 - 6.6	06/16/2020	0F00084	Water	REG	SW	0.00181		0.00068		0.00004	J								
DEEP_S	OL-3511-02	6.6 - 6.6	06/16/2020	0F00084	Water	FD	SW	0.00137				0.000031	J								
DEEP_S	OL-3511-03	39.6 - 39.6	06/16/2020	0F00084	Water	REG	SW	0.00093				0.000026	U								
DEEP_S	OL-3511-04	59.4 - 59.4	06/16/2020	0F00084	Water	REG	SW	0.001				0.000026	U								
QC	OL-3511-05		06/16/2020	0F00084	Water	FB	WQ	0.00021	J			0.000025	U								
DEEP_S	OL-3513-01	6.6 - 6.6	06/30/2020	UFI CHM 2020-040	Water	REG	SW							0.026		0.0289	J	2.25			
DEEP_S	OL-3513-02	6.6 - 6.6	06/30/2020	UFI CHM 2020-040	Water	FD	SW							0.026		0.0209	J	2.23			
DEEP_S	OL-3513-03	39.6 - 39.6	06/30/2020	UFI CHM 2020-040	Water	REG	SW							0.029		0.162		2.03			
DEEP_S	OL-3513-04	59.4 - 59.4	06/30/2020	UFI CHM 2020-040	Water	REG	SW							0.028		0.0433		2.25			
QC	OL-3513-05		06/30/2020	UFI CHM 2020-040	Water	FB	WQ							0.006	U	0.0134	J	0.03	U		
DEEP_S	OL-3515-01	6.6 - 6.6	06/30/2020	0G00003	Water	REG	SW	0.00035	J	0.00114	J	0.000025	U								
DEEP_S	OL-3515-02	6.6 - 6.6	06/30/2020	0G00003	Water	FD	SW	0.00125	J			0.000026	U								
DEEP_S	OL-3515-03	39.6 - 39.6	06/30/2020	0G00003	Water	REG	SW	0.00085				0.000026	U								
DEEP_S	OL-3515-04	59.4 - 59.4	06/30/2020	0G00003	Water	REG	SW	0.00062				0.000026	U								
QC	OL-3515-05		06/30/2020	0G00003	Water	FB	WQ	0.00008	U			0.000025	U								
DEEP_S	OL-3516-01	6.6 - 6.6	07/06/2020	UFI CHM 2020-052	Water	REG	SW							0.027		0.018	J	2.47			
DEEP_S	OL-3516-02	6.6 - 6.6	07/06/2020	UFI CHM 2020-052	Water	FD	SW							0.027		0.031	J	2.47			
DEEP_S	OL-3516-03	39.6 - 39.6	07/06/2020	UFI CHM 2020-052	Water	REG	SW							0.048		0.15		2.12			
DEEP_S	OL-3516-04	46.2 - 46.2	07/06/2020	UFI CHM 2020-052	Water	REG	SW													0.0007	J
DEEP_S	OL-3516-05	52.8 - 52.8	07/06/2020	UFI CHM 2020-052	Water	REG	SW							0.08		0.2		2.07		0.0013	J
DEEP_S	OL-3516-06	59.4 - 59.4	07/06/2020	UFI CHM 2020-052	Water	REG	SW							0.076		0.36		1.95		0.0009	J
DEEP_S	OL-3516-07	59.4 - 59.4	07/06/2020	UFI CHM 2020-052	Water	FD	SW													0.0018	J
QC	OL-3516-08		07/06/2020	UFI CHM 2020-052	Water	FB	WQ							0.006	U	0.03	U	0.03	U	0.0006	J
DEEP_S	OL-3519-01	6.6 - 6.6	07/06/2020	0G00018	Water	REG	SW	0.00065	J			0.000026	U								
DEEP_S	OL-3519-02	6.6 - 6.6	07/06/2020	0G00018	Water	FD	SW	0.00118	J			0.000026	U								
DEEP_S	OL-3519-03	39.6 - 39.6	07/06/2020	0G00018	Water	REG	SW	0.00132				0.000026	U								
DEEP_S	OL-3519-04	52.8 - 52.8	07/06/2020	0G00018	Water	REG	SW	0.00076				0.000026	U								
DEEP_S	OL-3519-05	59.4 - 59.4	07/06/2020	0G00018	Water	REG	SW	0.00062				0.000026	U								
QC	OL-3519-06		07/06/2020	0G00018	Water	FB	WQ	0.00013	J			0.000026	U								
DEEP_S	OL-3520-01	6.6 - 6.6	07/14/2020	UFI CHM 2020-052	Water	REG	SW							0.029		0.0343		2.44			
DEEP_S	OL-3520-02	6.6 - 6.6	07/14/2020	UFI CHM 2020-052	Water	FD	SW							0.03		0.026	J	2.39			
DEEP_S	OL-3520-03	39.6 - 39.6	07/14/2020	UFI CHM 2020-052	Water	REG	SW							0.113		0.104		2.23			

Onondaga Lake
2020 Nitrate Addition - Surface Water

							Parameter	MERCURY		MERCURY		METHYL MERCURY		NITRITE		NITROGEN, AMMONIA (AS N)		NITROGEN, NITRATE-NITRITE		REACTIVE PHOSPHATE	
							Method	E1631		E1631		E1630		E353.2		E350.1		E353.2		SM4500P-E	
							Filtered	T		D		T		T		T		T		T	
							Units	ug/l		ug/l		ug/l		mg/L		mg/L		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type														
DEEP_S	OL-3520-04	52.8 - 52.8	07/14/2020	UFI CHM 2020-052	Water	REG	SW							0.145		0.199		2.09			
DEEP_S	OL-3520-05	59.4 - 59.4	07/14/2020	UFI CHM 2020-052	Water	REG	SW							0.106		0.406		2.22			
QC	OL-3520-06		07/14/2020	UFI CHM 2020-052	Water	FB	WQ							0.006	U	0.0309		0.03	U		
DEEP_S	OL-3522-01	6.6 - 6.6	07/14/2020	0G00044	Water	REG	SW	0.00135		0.00107		0.000026	UJ								
DEEP_S	OL-3522-02	6.6 - 6.6	07/14/2020	0G00044	Water	FD	SW	0.00137				0.000056	J								
DEEP_S	OL-3522-03	39.6 - 39.6	07/14/2020	0G00044	Water	REG	SW	0.00075				0.000026	U								
DEEP_S	OL-3522-04	52.8 - 52.8	07/14/2020	0G00044	Water	REG	SW	0.00074				0.000152	J								
DEEP_S	OL-3522-05	59.4 - 59.4	07/14/2020	0G00044	Water	REG	SW	0.00074				0.000026	U								
QC	OL-3522-06		07/14/2020	0G00044	Water	FB	WQ	0.00008	U			0.000026	U								
DEEP_S	OL-3523-01	6.6 - 6.6	07/21/2020	UFI CHM 2020-067	Water	REG	SW							0.033		0.014	J	2.3			
DEEP_S	OL-3523-02	6.6 - 6.6	07/21/2020	UFI CHM 2020-067	Water	FD	SW							0.033		0.03	U	2.3			
DEEP_S	OL-3523-03	39.6 - 39.6	07/21/2020	UFI CHM 2020-067	Water	REG	SW							0.13		0.055		2.2			
DEEP_S	OL-3523-04	46.2 - 46.2	07/21/2020	UFI CHM 2020-067	Water	REG	SW													0.0008	
DEEP_S	OL-3523-05	52.8 - 52.8	07/21/2020	UFI CHM 2020-067	Water	REG	SW							0.16		0.14		2		0.0014	
DEEP_S	OL-3523-06	59.4 - 59.4	07/21/2020	UFI CHM 2020-067	Water	REG	SW							0.084		0.24		1.8		0.0017	
DEEP_S	OL-3523-07	59.4 - 59.4	07/21/2020	UFI CHM 2020-067	Water	FD	SW													0.002	
QC	OL-3523-08		07/21/2020	UFI CHM 2020-067	Water	FB	WQ							0.006	U	0.03	U	0.03	U	0.0018	U
DEEP_S	OL-3526-01	6.6 - 6.6	07/21/2020	0G00071	Water	REG	SW	0.00182				0.000117									
DEEP_S	OL-3526-02	6.6 - 6.6	07/21/2020	0G00071	Water	FD	SW	0.00135				0.000084									
DEEP_S	OL-3526-03	39.6 - 39.6	07/21/2020	0G00071	Water	REG	SW	0.00077				0.000025	U								
DEEP_S	OL-3526-04	52.8 - 52.8	07/21/2020	0G00071	Water	REG	SW	0.00071				0.000026	U								
DEEP_S	OL-3526-05	59.4 - 59.4	07/21/2020	0G00071	Water	REG	SW	0.00085				0.000026	U								
QC	OL-3526-06		07/21/2020	0G00071	Water	FB	WQ	0.00016	J			0.000026	U								
DEEP_S	OL-3527-01	6.6 - 6.6	07/28/2020	UFI CHM 2020-067	Water	REG	SW							0.035		0.018	J	2.1			
DEEP_S	OL-3527-02	6.6 - 6.6	07/28/2020	UFI CHM 2020-067	Water	FD	SW							0.035		0.021	J	2.1			
DEEP_S	OL-3527-03	39.6 - 39.6	07/28/2020	UFI CHM 2020-067	Water	REG	SW							0.14		0.063		2			
DEEP_S	OL-3527-04	52.8 - 52.8	07/28/2020	UFI CHM 2020-067	Water	REG	SW							0.13		0.26		1.9			
DEEP_S	OL-3527-05	59.4 - 59.4	07/28/2020	UFI CHM 2020-067	Water	REG	SW							0.073		0.57		4.1			
QC	OL-3527-06		07/28/2020	UFI CHM 2020-067	Water	FB	WQ							0.006	U	0.03	U	0.01	J		
DEEP_S	OL-3529-01	6.6 - 6.6	07/28/2020	0G00088	Water	REG	SW	0.00035	J	0.00058	J	0.00003	J								
DEEP_S	OL-3529-02	6.6 - 6.6	07/28/2020	0G00088	Water	FD	SW	0.0005	U			0.000041	J								
DEEP_S	OL-3529-03	39.6 - 39.6	07/28/2020	0G00088	Water	REG	SW	0.0005	U			0.000026	U								
DEEP_S	OL-3529-04	52.8 - 52.8	07/28/2020	0G00088	Water	REG	SW	0.0004	J			0.000025	U								
DEEP_S	OL-3529-05	59.4 - 59.4	07/28/2020	0G00088	Water	REG	SW	0.00185				0.000049	J								
QC	OL-3529-06		07/28/2020	0G00088	Water	FB	WQ	0.00008	U			0.000026	U								
DEEP_S	OL-3530-01	6.6 - 6.6	08/04/2020	UFI CHM 2020-074	Water	REG	SW							0.037		0.057	J	2.1	J		
DEEP_S	OL-3530-02	6.6 - 6.6	08/04/2020	UFI CHM 2020-074	Water	FD	SW							0.04		0.037	J	2.13	J		
DEEP_S	OL-3530-03	39.6 - 39.6	08/04/2020	UFI CHM 2020-074	Water	REG	SW							0.071		0.089		1.9	J		
DEEP_S	OL-3530-04	46.2 - 46.2	08/04/2020	UFI CHM 2020-074	Water	REG	SW													0.0038	
DEEP_S	OL-3530-05	52.8 - 52.8	08/04/2020	UFI CHM 2020-074	Water	REG	SW							0.088		0.41		1.9	J	0.0013	
DEEP_S	OL-3530-06	59.4 - 59.4	08/04/2020	UFI CHM 2020-074	Water	REG	SW							0.036		0.8		5.92	J	0.0018	
DEEP_S	OL-3530-07	59.4 - 59.4	08/04/2020	UFI CHM 2020-074	Water	FD	SW													0.0012	
QC	OL-3530-08		08/04/2020	UFI CHM 2020-074	Water	FB	WQ							0.006	U	0.023	J	0.016	J	0.0018	U
DEEP_S	OL-3533-01	6.6 - 6.6	08/04/2020	0H00021	Water	REG	SW	0.00092				0.000025	U								
DEEP_S	OL-3533-02	6.6 - 6.6	08/04/2020	0H00021	Water	FD	SW	0.00089				0.000026	U								
DEEP_S	OL-3533-03	39.6 - 39.6	08/04/2020	0H00021	Water	REG	SW	0.0005				0.000025	U								
DEEP_S	OL-3533-04	52.8 - 52.8	08/04/2020	0H00021	Water	REG	SW	0.0005				0.000026	U								
DEEP_S	OL-3533-05	59.4 - 59.4	08/04/2020	0H00021	Water	REG	SW	0.00082				0.000026	U								

Onondaga Lake
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							Parameter	MERCURY		MERCURY		METHYL MERCURY		NITRITE		NITROGEN, AMMONIA (AS N)		NITROGEN, NITRATE-NITRITE		REACTIVE PHOSPHATE	
							Method	E1631		E1631		E1630		E353.2		E350.1		E353.2		SM4500P-E	
							Filtered	T		D		T		T		T		T		T	
							Units	ug/l		ug/l		ug/l		mg/L		mg/L		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type														
QC	OL-3533-06		08/04/2020	0H00021	Water	FB	WQ	0.00029	J			0.000026	U								
DEEP_S	OL-3534-01	6.6 - 6.6	08/11/2020	UFI CHM 2020-074	Water	REG	SW							0.035		0.016	J	1.9			
DEEP_S	OL-3534-02	6.6 - 6.6	08/11/2020	UFI CHM 2020-074	Water	FD	SW							0.035		0.041	J	1.9			
DEEP_S	OL-3534-03	39.6 - 39.6	08/11/2020	UFI CHM 2020-074	Water	REG	SW							0.054		0.096		1.7			
DEEP_S	OL-3534-04	52.8 - 52.8	08/11/2020	UFI CHM 2020-074	Water	REG	SW							0.072		0.32		2.9			
DEEP_S	OL-3534-05	59.4 - 59.4	08/11/2020	UFI CHM 2020-074	Water	REG	SW							0.043		0.78		3.5			
QC	OL-3534-06		08/11/2020	UFI CHM 2020-074	Water	FB	WQ							0.006	U	0.011	J	0.03	U		
DEEP_S	OL-3536-01	6.6 - 6.6	08/11/2020	0H00039	Water	REG	SW	0.00008	U	0.00008	U	0.000074	U								
DEEP_S	OL-3536-02	6.6 - 6.6	08/11/2020	0H00039	Water	FD	SW	0.00008	U			0.000066	U								
DEEP_S	OL-3536-03	39.6 - 39.6	08/11/2020	0H00039	Water	REG	SW	0.00008	U			0.000074	U								
DEEP_S	OL-3536-04	52.8 - 52.8	08/11/2020	0H00039	Water	REG	SW	0.00009	J	0.00008	U	0.00003	J								
DEEP_S	OL-3536-05	59.4 - 59.4	08/11/2020	0H00039	Water	REG	SW	0.00065				0.000054									
QC	OL-3536-06		08/11/2020	0H00039	Water	FB	WQ	0.00008	U			0.000076									
DEEP_S	OL-3537-01	6.6 - 6.6	08/18/2020	UFI CHM 2020-080	Water	REG	SW							0.042		0.0333		2.15			
DEEP_S	OL-3537-02	6.6 - 6.6	08/18/2020	UFI CHM 2020-080	Water	FD	SW							0.043		0.0255		2.17			
DEEP_S	OL-3537-03	39.6 - 39.6	08/18/2020	UFI CHM 2020-080	Water	REG	SW							0.052		0.0891		1.69			
DEEP_S	OL-3537-04	46.2 - 46.2	08/18/2020	UFI CHM 2020-080	Water	REG	SW													0.0006	J
DEEP_S	OL-3537-05	52.8 - 52.8	08/18/2020	UFI CHM 2020-080	Water	REG	SW							0.083		0.251		1.72		0.0018	U
DEEP_S	OL-3537-06	59.4 - 59.4	08/18/2020	UFI CHM 2020-080	Water	REG	SW							0.078		0.693		2.59		0.0009	J
DEEP_S	OL-3537-07	59.4 - 59.4	08/18/2020	UFI CHM 2020-080	Water	FD	SW													0.0007	J
QC	OL-3537-08		08/18/2020	UFI CHM 2020-080	Water	FB	WQ							0.002	J	0.018	J	0.03	U	0.0018	U
DEEP_S	OL-3540-01	6.6 - 6.6	08/18/2020	0H00065	Water	REG	SW	0.00124				0.000082									
DEEP_S	OL-3540-02	6.6 - 6.6	08/18/2020	0H00065	Water	FD	SW	0.0014				0.00006	U								
DEEP_S	OL-3540-03	39.6 - 39.6	08/18/2020	0H00065	Water	REG	SW	0.00132				0.00005	U								
DEEP_S	OL-3540-04	52.8 - 52.8	08/18/2020	0H00065	Water	REG	SW	0.00094				0.00005	U								
DEEP_S	OL-3540-05	59.4 - 59.4	08/18/2020	0H00065	Water	REG	SW	0.00081				0.00005	U								
QC	OL-3540-06		08/18/2020	0H00065	Water	FB	WQ	0.0006				0.000041	J								
QC	OL-3540-07		08/18/2020	0H00065	Water	EB	WQ	0.00051				0.000068									
DEEP_S	OL-3541-01	6.6 - 6.6	08/26/2020	UFI CHM 2020-080	Water	REG	SW							0.041		0.021	J	2.2			
DEEP_S	OL-3541-02	6.6 - 6.6	08/26/2020	UFI CHM 2020-080	Water	FD	SW							0.042		0.022		2.3			
DEEP_S	OL-3541-03	39.6 - 39.6	08/26/2020	UFI CHM 2020-080	Water	REG	SW							0.03		0.13		1.6			
DEEP_S	OL-3541-04	52.8 - 52.8	08/26/2020	UFI CHM 2020-080	Water	REG	SW							0.072		0.34		3.3			
DEEP_S	OL-3541-05	59.4 - 59.4	08/26/2020	UFI CHM 2020-080	Water	REG	SW							0.068		0.5		3.6			
QC	OL-3541-06		08/26/2020	UFI CHM 2020-080	Water	FB	WQ							0.006	U	0.03	U	0.03	U		
DEEP_S	OL-3543-01	6.6 - 6.6	08/26/2020	0H00095	Water	REG	SW	0.00089		0.00008	U	0.000049	J								
DEEP_S	OL-3543-02	6.6 - 6.6	08/26/2020	0H00095	Water	FD	SW	0.00074				0.000059									
DEEP_S	OL-3543-03	39.6 - 39.6	08/26/2020	0H00095	Water	REG	SW	0.0005	U			0.000049	U								
DEEP_S	OL-3543-04	52.8 - 52.8	08/26/2020	0H00095	Water	REG	SW	0.0005		0.00016	J	0.000056									
DEEP_S	OL-3543-05	59.4 - 59.4	08/26/2020	0H00095	Water	REG	SW	0.00061				0.000064									
QC	OL-3543-06		08/26/2020	0H00095	Water	FB	WQ	0.00038	J			0.000047	J								
DEEP_S	OL-3544-01	6.6 - 6.6	09/01/2020	UFI CHM 2020-098	Water	REG	SW							0.065		0.067	U	2.22			
DEEP_S	OL-3544-02	6.6 - 6.6	09/01/2020	UFI CHM 2020-098	Water	FD	SW							0.065		0.063	U	2.24			
DEEP_S	OL-3544-03	39.6 - 39.6	09/01/2020	UFI CHM 2020-098	Water	REG	SW							0.006		0.28		1.61			
DEEP_S	OL-3544-04	46.2 - 46.2	09/01/2020	UFI CHM 2020-098	Water	REG	SW													0.0007	J
DEEP_S	OL-3544-05	52.8 - 52.8	09/01/2020	UFI CHM 2020-098	Water	REG	SW							0.048		0.415		1.96		0.0006	J
DEEP_S	OL-3544-06	59.4 - 59.4	09/01/2020	UFI CHM 2020-098	Water	REG	SW							0.042		0.897		3.32		0.0015	J
DEEP_S	OL-3544-07	59.4 - 59.4	09/01/2020	UFI CHM 2020-098	Water	FD	SW													0.0016	J
QC	OL-3544-08		09/01/2020	UFI CHM 2020-098	Water	FB	WQ							0.006	U	0.0957		0.022	J	0.0018	U

Onondaga Lake
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							Parameter	MERCURY		MERCURY		METHYL MERCURY		NITRITE		NITROGEN, AMMONIA (AS N)		NITROGEN, NITRATE-NITRITE		REACTIVE PHOSPHATE	
							Method	E1631		E1631		E1630		E353.2		E350.1		E353.2		SM4500P-E	
							Filtered	T		D		T		T		T		T		T	
							Units	ug/l		ug/l		ug/l		mg/L		mg/L		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type														
DEEP_S	OL-3547-01	6.6 - 6.6	09/01/2020	0I00011	Water	REG	SW	0.00089				0.000025	U								
DEEP_S	OL-3547-02	6.6 - 6.6	09/01/2020	0I00011	Water	FD	SW	0.00082				0.000026	U								
DEEP_S	OL-3547-03	39.6 - 39.6	09/01/2020	0I00011	Water	REG	SW	0.00104				0.000077									
DEEP_S	OL-3547-04	52.8 - 52.8	09/01/2020	0I00011	Water	REG	SW	0.00065				0.000075									
DEEP_S	OL-3547-05	59.4 - 59.4	09/01/2020	0I00011	Water	REG	SW	0.00106				0.000084									
QC	OL-3547-06		09/01/2020	0I00011	Water	FB	WQ	0.0001	J			0.000026	U								
DEEP_S	OL-3549-01	6.6 - 6.6	09/09/2020	UFI CHM 2020-098	Water	REG	SW							0.051		0.03	U	2.18			
DEEP_S	OL-3549-02	6.6 - 6.6	09/09/2020	UFI CHM 2020-098	Water	FD	SW							0.053		0.03	U	2.18			
DEEP_S	OL-3549-03	39.6 - 39.6	09/09/2020	UFI CHM 2020-098	Water	REG	SW							0.007		0.28		1.64			
DEEP_S	OL-3549-04	52.8 - 52.8	09/09/2020	UFI CHM 2020-098	Water	REG	SW							0.01		0.533		5.14			
DEEP_S	OL-3549-05	59.4 - 59.4	09/09/2020	UFI CHM 2020-098	Water	REG	SW							0.009		0.822		10.62			
QC	OL-3549-06		09/09/2020	UFI CHM 2020-098	Water	FB	WQ							0.006	U	0.0212		0.0312			
DEEP_S	OL-3552-01	6.6 - 6.6	09/09/2020	0I00030	Water	REG	SW	0.00068		0.00008	U	0.000071	J								
DEEP_S	OL-3552-02	6.6 - 6.6	09/09/2020	0I00030	Water	FD	SW	0.00048	J			0.000025	UJ								
DEEP_S	OL-3552-03	39.6 - 39.6	09/09/2020	0I00030	Water	REG	SW	0.00111				0.000076									
DEEP_S	OL-3552-04	52.8 - 52.8	09/09/2020	0I00030	Water	REG	SW	0.0014		0.00008	U	0.000089									
DEEP_S	OL-3552-05	59.4 - 59.4	09/09/2020	0I00030	Water	REG	SW	0.0025				0.000078									
QC	OL-3552-06		09/09/2020	0I00030	Water	FB	WQ	0.00008	U			0.000053									
DEEP_S	OL-3553-01	6.6 - 6.6	09/15/2020	UFI CHM 2020-110	Water	REG	SW							0.051		0.046		2.21			
DEEP_S	OL-3553-02	6.6 - 6.6	09/15/2020	UFI CHM 2020-110	Water	FD	SW							0.045		0.046		2.2			
DEEP_S	OL-3553-03	39.6 - 39.6	09/15/2020	UFI CHM 2020-110	Water	REG	SW							0.009		0.294		1.58			
DEEP_S	OL-3553-04	46.2 - 46.2	09/15/2020	UFI CHM 2020-110	Water	REG	SW													0.0018	U
DEEP_S	OL-3553-05	52.8 - 52.8	09/15/2020	UFI CHM 2020-110	Water	REG	SW							0.008		0.557		7.03		0.0007	J
DEEP_S	OL-3553-06	59.4 - 59.4	09/15/2020	UFI CHM 2020-110	Water	REG	SW							0.005	J	0.988		3.56		0.0029	
DEEP_S	OL-3553-07	59.4 - 59.4	09/15/2020	UFI CHM 2020-110	Water	FD	SW													0.0025	
QC	OL-3553-08		09/15/2020	UFI CHM 2020-110	Water	FB	WQ							0.006	U	0.03	U	0.03	U	0.0018	U
DEEP_S	OL-3556-01	6.6 - 6.6	09/15/2020	0I00050	Water	REG	SW	0.00057				0.000058									
DEEP_S	OL-3556-02	6.6 - 6.6	09/15/2020	0I00050	Water	FD	SW	0.00055				0.000056									
DEEP_S	OL-3556-03	39.6 - 39.6	09/15/2020	0I00050	Water	REG	SW	0.0009				0.000045	J								
DEEP_S	OL-3556-04	52.8 - 52.8	09/15/2020	0I00050	Water	REG	SW	0.00139				0.000081									
DEEP_S	OL-3556-05	59.4 - 59.4	09/15/2020	0I00050	Water	REG	SW	0.00296				0.000055									
QC	OL-3556-06		09/15/2020	0I00050	Water	FB	WQ	0.00008	U			0.000026	U								
DEEP_S	OL-3557-01	6.6 - 6.6	09/22/2020	UFI CHM 2020-110	Water	REG	SW							0.043		0.036		2.21			
DEEP_S	OL-3557-02	6.6 - 6.6	09/22/2020	UFI CHM 2020-110	Water	FD	SW							0.044		0.037		2.2			
DEEP_S	OL-3557-03	39.6 - 39.6	09/22/2020	UFI CHM 2020-110	Water	REG	SW							0.024		0.281		1.53			
DEEP_S	OL-3557-04	52.8 - 52.8	09/22/2020	UFI CHM 2020-110	Water	REG	SW							0.006	J	0.547		2.2			
DEEP_S	OL-3557-05	59.4 - 59.4	09/22/2020	UFI CHM 2020-110	Water	REG	SW							0.007		0.765		5.13			
QC	OL-3557-06	-	09/22/2020	UFI CHM 2020-110	Water	REG	WQ							0.006	U	0.03	U	0.03	U		
DEEP_S	OL-3560-01	6.6 - 6.6	09/22/2020	0I00075	Water	REG	SW	0.00067		0.00033	J	0.000044	J								
DEEP_S	OL-3560-02	6.6 - 6.6	09/22/2020	0I00075	Water	FD	SW	0.00059				0.00006									
DEEP_S	OL-3560-03	39.6 - 39.6	09/22/2020	0I00075	Water	REG	SW	0.00085				0.00008									
DEEP_S	OL-3560-04	52.8 - 52.8	09/22/2020	0I00075	Water	REG	SW	0.0012	J	0.00328	J	0.000076									
DEEP_S	OL-3560-05	59.4 - 59.4	09/22/2020	0I00075	Water	REG	SW	0.003				0.000076									
QC	OL-3560-06		09/22/2020	0I00075	Water	FB	WQ	0.00037	J			0.000025	U								
DEEP_S	OL-3561-01	6.6 - 6.6	09/29/2020	UFI CHM 2020-116	Water	REG	SW							0.046		0.053		2.16			
DEEP_S	OL-3561-02	6.6 - 6.6	09/29/2020	UFI CHM 2020-116	Water	FD	SW							0.047		0.059		2.2			
DEEP_S	OL-3561-03	39.6 - 39.6	09/29/2020	UFI CHM 2020-116	Water	REG	SW							0.042		0.124		1.88			
DEEP_S	OL-3561-04	46.2 - 46.2	09/29/2020	UFI CHM 2020-116	Water	REG	SW													0.0008	J

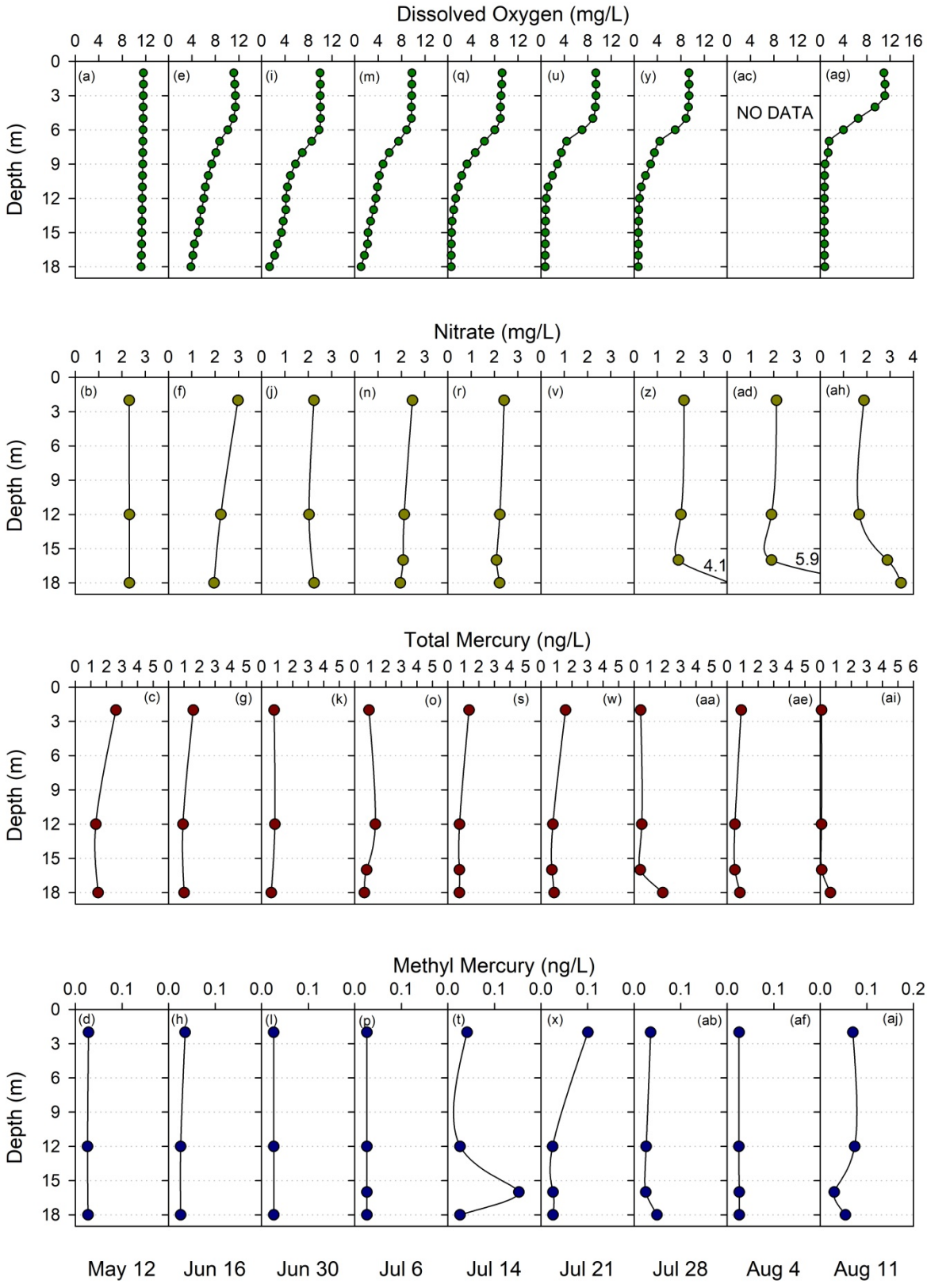
Onondaga Lake
2020 Nitrate Addition - Surface Water

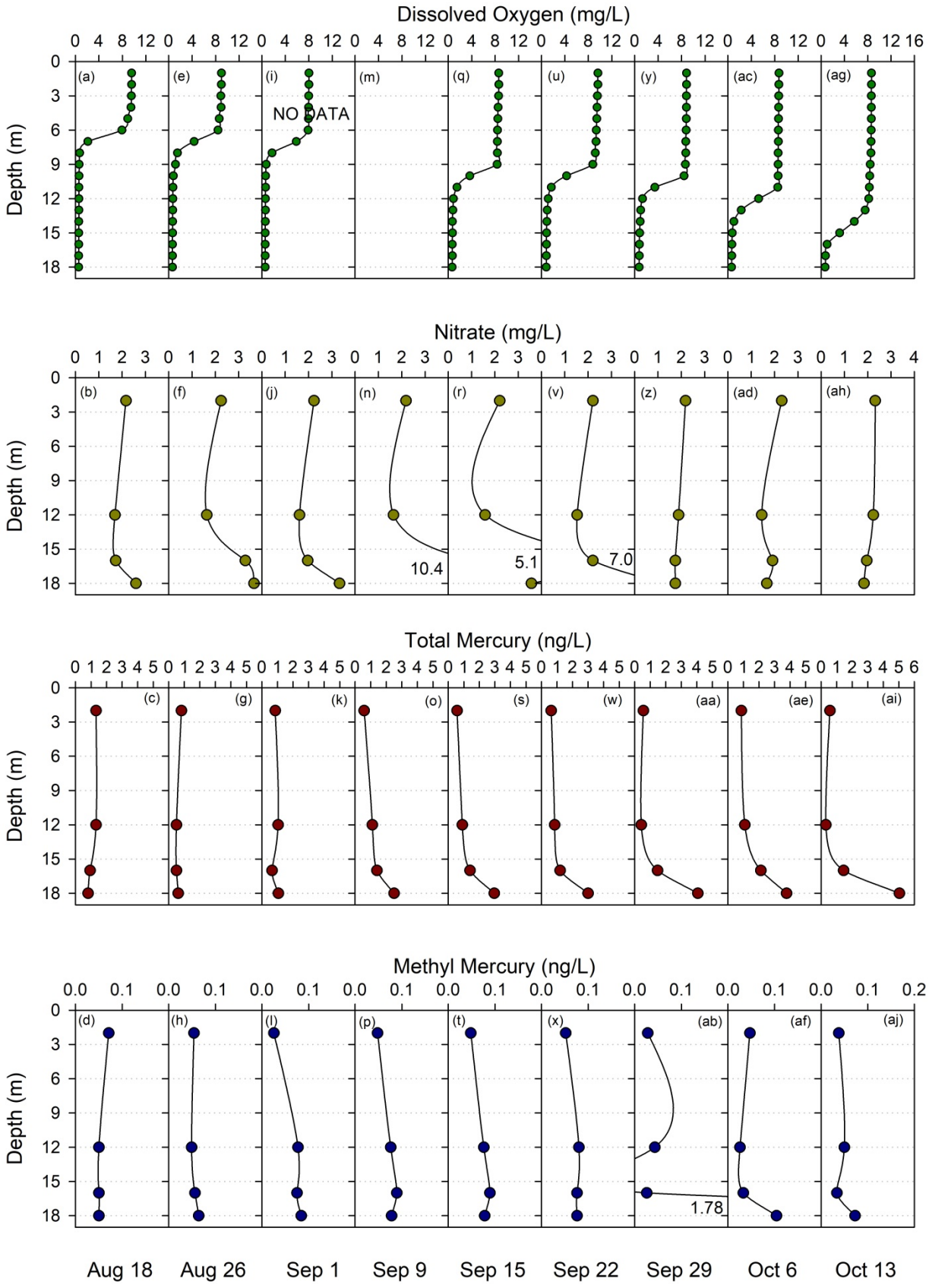
							Parameter	MERCURY		MERCURY		METHYL MERCURY		NITRITE		NITROGEN, AMMONIA (AS N)		NITROGEN, NITRATE-NITRITE		REACTIVE PHOSPHATE	
							Method	E1631		E1631		E1630		E353.2		E350.1		E353.2		SM4500P-E	
							Filtered	T		D		T		T		T		T		T	
							Units	ug/l		ug/l		ug/l		mg/L		mg/L		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type														
DEEP_S	OL-3561-05	52.8 - 52.8	09/29/2020	UFI CHM 2020-116	Water	REG	SW							0.006		0.526		1.74		0.0015	J
DEEP_S	OL-3561-06	59.4 - 59.4	09/29/2020	UFI CHM 2020-116	Water	REG	SW							0.004	J	0.523		1.74		0.0039	
DEEP_S	OL-3561-07	59.4 - 59.4	09/29/2020	UFI CHM 2020-116	Water	FD	SW													0.0039	
QC	OL-3561-08		09/29/2020	UFI CHM 2020-116	Water	FB	WQ							0.006	U	0.025	J	0.03	U	0.0018	U
DEEP_S	OL-3564-01	6.6 - 6.6	09/29/2020	0J00002	Water	REG	SW	0.00049	J			0.000025	U								
DEEP_S	OL-3564-02	6.6 - 6.6	09/29/2020	0J00002	Water	FD	SW	0.00063				0.000031	J								
DEEP_S	OL-3564-03	39.6 - 39.6	09/29/2020	0J00002	Water	REG	SW	0.00043	J			0.000043	J								
DEEP_S	OL-3564-04	52.8 - 52.8	09/29/2020	0J00002	Water	REG	SW	0.00147				0.000026	U								
DEEP_S	OL-3564-05	59.4 - 59.4	09/29/2020	0J00002	Water	REG	SW	0.00406				0.00178									
QC	OL-3564-06		09/29/2020	0J00002	Water	FB	WQ	0.00023	J			0.000026	U								
DEEP_S	OL-3565-01	6.6 - 6.6	10/06/2020	UFI CHM 2020-116	Water	REG	SW							0.047		0.052		2.31			
DEEP_S	OL-3565-02	6.6 - 6.6	10/06/2020	UFI CHM 2020-116	Water	FD	SW							0.048		0.059		2.3			
DEEP_S	OL-3565-03	39.6 - 39.6	10/06/2020	UFI CHM 2020-116	Water	REG	SW							0.01		0.311		1.45			
DEEP_S	OL-3565-04	52.8 - 52.8	10/06/2020	UFI CHM 2020-116	Water	REG	SW							0.006		0.529		1.91			
DEEP_S	OL-3565-05	59.4 - 59.4	10/06/2020	UFI CHM 2020-116	Water	REG	SW							0.005	J	0.687		1.67			
QC	OL-3565-06		10/06/2020	UFI CHM 2020-116	Water	FB	WQ							0.006	U	0.012	J	0.03	U		
DEEP_S	OL-3568-01	6.6 - 6.6	10/06/2020	0J00027	Water	REG	SW	0.00093		0.00027	J	0.000065									
DEEP_S	OL-3568-02	6.6 - 6.6	10/06/2020	0J00027	Water	FD	SW	0.00081				0.000029	J								
DEEP_S	OL-3568-03	39.6 - 39.6	10/06/2020	0J00027	Water	REG	SW	0.00109				0.000026	U								
DEEP_S	OL-3568-04	52.8 - 52.8	10/06/2020	0J00027	Water	REG	SW	0.00212		0.00039	J	0.000033	J								
DEEP_S	OL-3568-05	59.4 - 59.4	10/06/2020	0J00027	Water	REG	SW	0.00377				0.000104									
QC	OL-3568-06		10/06/2020	0J00027	Water	FB	WQ	0.00008	U			0.000025	U								
DEEP_S	OL-3569-01	6.6 - 6.6	10/13/2020	UFI CHM 2020-126	Water	REG	SW							0.043		0.094		2.31			
DEEP_S	OL-3569-02	6.6 - 6.6	10/13/2020	UFI CHM 2020-126	Water	FD	SW							0.043		0.097		2.34			
DEEP_S	OL-3569-03	39.6 - 39.6	10/13/2020	UFI CHM 2020-126	Water	REG	SW							0.042		0.12		2.24			
DEEP_S	OL-3569-04	46.2 - 46.2	10/13/2020	UFI CHM 2020-126	Water	REG	SW													0.0007	J
DEEP_S	OL-3569-05	52.8 - 52.8	10/13/2020	UFI CHM 2020-126	Water	REG	SW							0.007		0.577		1.96		0.0015	J
DEEP_S	OL-3569-06	59.4 - 59.4	10/13/2020	UFI CHM 2020-126	Water	REG	SW							0.006	J	0.691		1.84		0.0027	
DEEP_S	OL-3569-07	59.4 - 59.4	10/13/2020	UFI CHM 2020-126	Water	FD	SW													0.0027	
QC	OL-3569-08		10/13/2020	UFI CHM 2020-126	Water	FB	WQ							0.006	U	0.023	J	0.0112	J	0.0018	U
DEEP_S	OL-3572-01	6.6 - 6.6	10/13/2020	0J00070	Water	REG	SW	0.00058				0.00005	U								
DEEP_S	OL-3572-02	6.6 - 6.6	10/13/2020	0J00070	Water	FD	SW	0.00056				0.000026	U								
DEEP_S	OL-3572-03	39.6 - 39.6	10/13/2020	0J00070	Water	REG	SW	0.00031	J			0.00005									
DEEP_S	OL-3572-04	52.8 - 52.8	10/13/2020	0J00070	Water	REG	SW	0.00145				0.000034	J								
DEEP_S	OL-3572-05	59.4 - 59.4	10/13/2020	0J00070	Water	REG	SW	0.00504				0.000073									
QC	OL-3572-06		10/13/2020	0J00070	Water	FB	WQ	0.00008	U			0.000025	U								
DEEP_S	OL-3573-01	6.6 - 6.6	10/20/2020	UFI CHM 2020-126	Water	REG	SW							0.04		0.128		2.03			
DEEP_S	OL-3573-02	6.6 - 6.6	10/20/2020	UFI CHM 2020-126	Water	FD	SW							0.042		0.13		2.17			
DEEP_S	OL-3573-03	39.6 - 39.6	10/20/2020	UFI CHM 2020-126	Water	REG	SW							0.043		0.15		2.11			
DEEP_S	OL-3573-04	52.8 - 52.8	10/20/2020	UFI CHM 2020-126	Water	REG	SW							0.017		0.577		1.48			
DEEP_S	OL-3573-05	59.4 - 59.4	10/20/2020	UFI CHM 2020-126	Water	REG	SW							0.022		0.536		1.86			
QC	OL-3573-06		10/20/2020	UFI CHM 2020-126	Water	FB	WQ							0.006	U	0.025	J	0.03	U		
DEEP_S	OL-3576R-01	6.6 - 6.6	10/23/2020	0J00123	Water	REG	SW	0.00047	J	0.00014	J	0.000026	U								
DEEP_S	OL-3576R-02	6.6 - 6.6	10/23/2020	0J00123	Water	FD	SW	0.00008	U			0.000025	U								
DEEP_S	OL-3576R-03	39.6 - 39.6	10/23/2020	0J00123	Water	REG	SW	0.0005	U			0.000026	U								
DEEP_S	OL-3576R-04	52.8 - 52.8	10/23/2020	0J00123	Water	REG	SW	0.00096		0.00008	U	0.000069									
DEEP_S	OL-3576R-05	59.4 - 59.4	10/23/2020	0J00123	Water	REG	SW	0.00211				0.000091									
QC	OL-3576R-06		10/23/2020	0J00123	Water	FB	WQ	0.00008	U			0.000025	U								

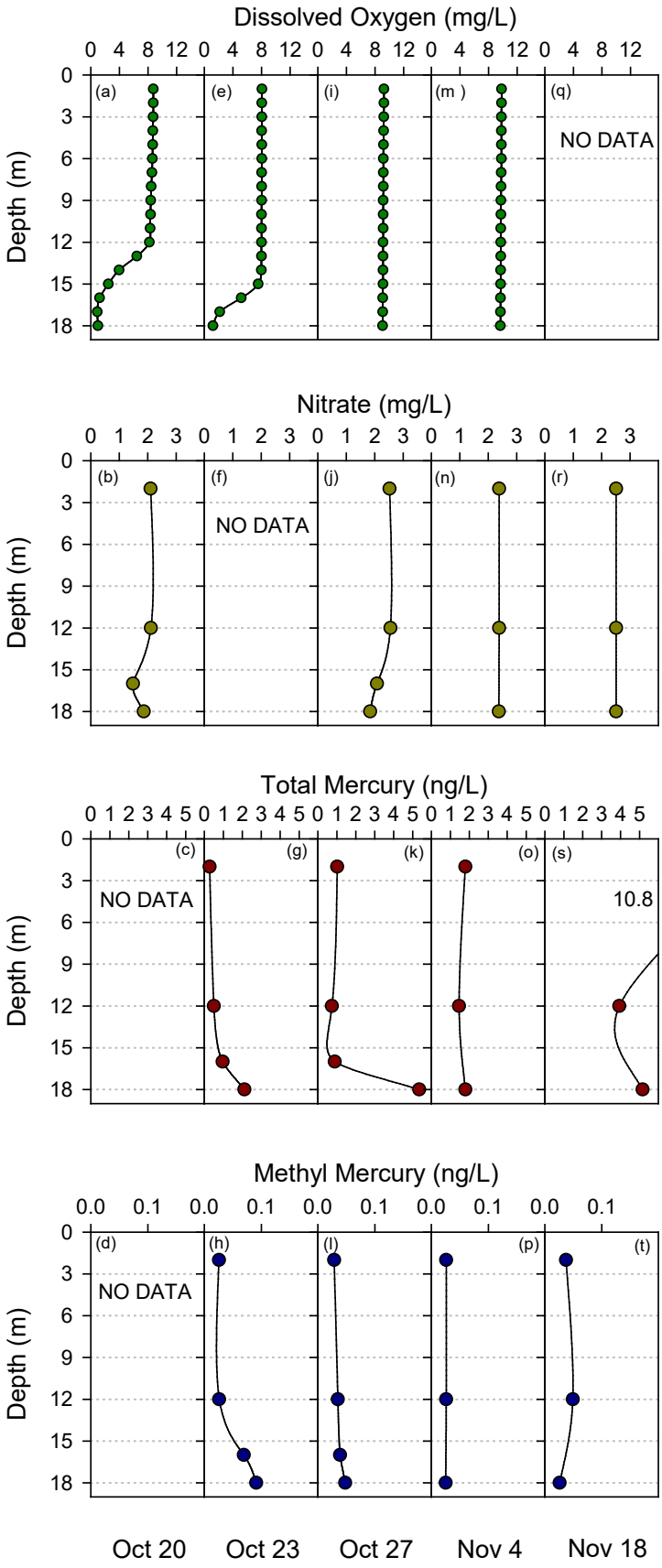
Onondaga Lake
2020 Nitrate Addition - Surface Water

							Parameter	MERCURY		MERCURY		METHYL MERCURY		NITRITE		NITROGEN, AMMONIA (AS N)		NITROGEN, NITRATE-NITRITE		REACTIVE PHOSPHATE	
							Method	E1631		E1631		E1630		E353.2		E350.1		E353.2		SM4500P-E	
							Filtered	T		D		T		T		T		T		T	
							Units	ug/l		ug/l		ug/l		mg/L		mg/L		mg/L		mg/L	
Location ID	Field Sample ID	Depth (ft)	Sampled	SDG	Matrix	Purpose	Sample Type														
DEEP_S	OL-3577-01	6.6 - 6.6	10/27/2020	UFI CHM 2020-127	Water	REG	SW							0.043		0.171		2.49			
DEEP_S	OL-3577-02	6.6 - 6.6	10/27/2020	UFI CHM 2020-127	Water	FD	SW							0.044		0.167		2.55			
DEEP_S	OL-3577-03	39.6 - 39.6	10/27/2020	UFI CHM 2020-127	Water	REG	SW							0.043		0.167		2.55			
DEEP_S	OL-3577-04	46.2 - 46.2	10/27/2020	UFI CHM 2020-127	Water	REG	SW													0.0012	J
DEEP_S	OL-3577-05	52.8 - 52.8	10/27/2020	UFI CHM 2020-127	Water	REG	SW							0.039		0.386		2.08		0.0023	
DEEP_S	OL-3577-06	59.4 - 59.4	10/27/2020	UFI CHM 2020-127	Water	REG	SW							0.037		0.467		1.84		0.0037	
DEEP_S	OL-3577-07	59.4 - 59.4	10/27/2020	UFI CHM 2020-127	Water	FD	SW													0.0042	
QC	OL-3577-08		10/27/2020	UFI CHM 2020-127	Water	FB	WQ							0.006	U	0.019	J	0.03	U	0.0018	U
DEEP_S	OL-3580-01	6.6 - 6.6	10/27/2020	0J00134	Water	REG	SW	0.00136	J	0.00066		0.000032	J								
DEEP_S	OL-3580-02	6.6 - 6.6	10/27/2020	0J00134	Water	FD	SW	0.00068	J			0.000025	U								
DEEP_S	OL-3580-03	39.6 - 39.6	10/27/2020	0J00134	Water	REG	SW	0.00074				0.000035	J								
DEEP_S	OL-3580-04	52.8 - 52.8	10/27/2020	0J00134	Water	REG	SW	0.00089				0.000039	J								
DEEP_S	OL-3580-05	59.4 - 59.4	10/27/2020	0J00134	Water	REG	SW	0.00535				0.000048	J								
QC	OL-3580-06		10/27/2020	0J00134	Water	FB	WQ	0.00008	U			0.000025	U								
DEEP_S	OL-3581-01	6.6 - 6.6	11/04/2020	UFI CHM 2020-127	Water	REG	SW							0.046		0.199		2.38			
DEEP_S	OL-3581-02	6.6 - 6.6	11/04/2020	UFI CHM 2020-127	Water	FD	SW							0.046		0.199		2.38			
DEEP_S	OL-3581-03	39.6 - 39.6	11/04/2020	UFI CHM 2020-127	Water	REG	SW							0.047		0.2		2.38			
DEEP_S	OL-3581-04	59.4 - 59.4	11/04/2020	UFI CHM 2020-127	Water	REG	SW							0.047		0.199		2.37			
QC	OL-3581-05		11/04/2020	UFI CHM 2020-127	Water	FB	WQ							0.006	U	0.012	J	0.013	J		
DEEP_S	OL-3584-01	6.6 - 6.6	11/04/2020	0K00025	Water	REG	SW	0.00215		0.00081		0.000026	U								
DEEP_S	OL-3584-02	6.6 - 6.6	11/04/2020	0K00025	Water	FD	SW	0.00143				0.000026	U								
DEEP_S	OL-3584-03	39.6 - 39.6	11/04/2020	0K00025	Water	REG	SW	0.00146				0.000026	U								
DEEP_S	OL-3584-04	59.4 - 59.4	11/04/2020	0K00025	Water	REG	SW	0.00179				0.000025	U								
QC	OL-3584-05		11/04/2020	0K00025	Water	FB	WQ	0.00009	J			0.000025	U								
QC	OL-3584-06		11/03/2020	0K00025	Water	EB	WQ	0.00024	J			0.000026	U								
DEEP_S	OL-3585-01	6.6 - 6.6	11/18/2020	UFI CHM 2020-137	Water	REG	SW							0.055		0.249		2.53			
DEEP_S	OL-3585-02	6.6 - 6.6	11/18/2020	UFI CHM 2020-137	Water	FD	SW							0.055		0.247		2.49			
DEEP_S	OL-3585-03	39.6 - 39.6	11/18/2020	UFI CHM 2020-137	Water	REG	SW							0.054		0.266		2.51			
DEEP_S	OL-3585-04	59.4 - 59.4	11/18/2020	UFI CHM 2020-137	Water	REG	SW							0.055		0.292		2.51			
QC	OL-3585-05		11/18/2020	UFI CHM 2020-137	Water	FB	WQ							0.006	U	0.04		0.03	U		
DEEP_S	OL-3588-01	6.6 - 6.6	11/18/2020	0K00093	Water	REG	SW	0.014		0.0106		0.000049	U								
DEEP_S	OL-3588-02	6.6 - 6.6	11/18/2020	0K00093	Water	FD	SW	0.0076				0.000025	U								
DEEP_S	OL-3588-03	39.6 - 39.6	11/18/2020	0K00093	Water	REG	SW	0.00393				0.000049	U								
DEEP_S	OL-3588-04	59.4 - 59.4	11/18/2020	0K00093	Water	REG	SW	0.00516				0.000026	U								
QC	OL-3588-05		11/18/2020	0K00093	Water	FB	WQ	0.00279				0.000026	U								

APPENDIX 5E - PLOTS OF DISSOLVED OXYGEN, NITRATE, TOTAL MERCURY AND METHYLMERCURY CONCENTRATIONS WITH DEPTH AT SOUTH DEEP FOR 2020


Dissolved Oxygen (mg/L)
Nitrate (mg/L)
Total Mercury (ng/L)
Methyl Mercury (ng/L)
Depth (m)
NO DATA
4.1
5.9
May 12
Jun 16
Jun 30
Jul 6
Jul 14
Jul 21
Jul 28
Aug 4
Aug 11


Dissolved Oxygen (mg/L)
Nitrate (mg/L)
Total Mercury (ng/L)
Methyl Mercury (ng/L)
Depth (m)
NO DATA
10.4
5.1
7.0
1.78
Aug 18
Aug 26
Sep 1
Sep 9
Sep 15
Sep 22
Sep 29
Oct 6
Oct 13


Dissolved Oxygen (mg/L)
0 4 8 12
(a)
(e)
(i)
(m)
(q)
NO DATA
Nitrate (mg/L)
0 1 2 3
(b)
(f)
NO DATA
(j)
(n)
(r)
Total Mercury (ng/L)
0 1 2 3 4 5
(c)
NO DATA
(g)
(k)
(o)
(s)
10.8
Methyl Mercury (ng/L)
0.0 0.1
(d)
NO DATA
(h)
(l)
(p)
(t)
Depth (m)
0 3 6 9 12 15 18
Oct 20
Oct 23
Oct 27
Nov 4
Nov 18

APPENDIX 6A - MEMORANDUM: ONONDAGA LAKE SEDIMENT CAP MONITORING- EVENT- BASED MONITORING EVALUATION

290 Elwood Davis Road, Suite 340
Liverpool, New York 13088
315.453.9009

ANCHOR QEA

Memorandum

July 22, 2021

To: Edward Glaza, PE, Parsons

From: Matt Henderson, PE, and Abagayle Hilton, Anchor QEA, LLC

cc: Paul LaRosa, PE, and Deirdre Reidy, Anchor QEA, LLC

Re: Onondaga Lake Sediment Cap Monitoring – Event-Based Monitoring Evaluation

In accordance with Section 6.3.2 (Event-based Monitoring of the Sediment Cap) of the *Onondaga Lake Monitoring and Maintenance Plan* (OLMMP; Parsons 2018), the following three extreme event conditions are being used to trigger required event-based monitoring of the cap:

- A 50-year or greater wind-generated wave event
- A 50-year or greater tributary flow event
- A seismic event measuring 5.5 or larger on the Richter scale within 30 miles of Onondaga Lake

Publicly available data obtained from January 1, 2020, through May 1, 2021, were analyzed to determine if event-based monitoring of the cap has been triggered by one or more of these events. Based on the summary of 2020 and 2021 data presented and described in this memorandum, event-based physical monitoring of the cap was not triggered during this time period.

Wind-Generated Wave Event Evaluation

In accordance with the OLMMP, the occurrence of a wind-generated wave event may warrant monitoring in certain remediation areas, depending on the wave direction (e.g., from the northwest). Because wave measurements are not collected in Onondaga Lake, wind data reported from the meteorological station at Hancock International Airport (located approximately 5 miles east of Onondaga Lake) were reviewed and analyzed to determine if a 50-year wind event may have occurred in the directions affecting the remediation areas. This analysis is based on wind speed, assuming that a 50-year wind event corresponds to a 50-year wind-generated wave event.

The wind speed data were grouped by the recorded wind direction, and the maximum recorded wind speed for each direction was compared to the 50-year event threshold value (as presented in Table 6.4A of the OLMMP). Table 1 summarizes the comparison between the threshold 50-year return-interval wind speeds and maximum recorded wind speeds for January 2020 through May 1, 2021.

Table 1
50-Year Event Wind Speeds Compared to Maximum Recorded Wind Speeds for January 2020 through May 1, 2021

Remediation Area	Wind Direction (degrees from north[1])	50-Year Event Wind Speed (mph)	Maximum Recorded Wind Speed for January 2020 to May 1, 2021 (mph)	Date of Measured Maximum Wind Speed
RA-A and RA-F1	330 to 100	45	21.9	1/29/2021
RA-B	330 to 130	45	27.7	4/29/2020
RA-C	0 to 130	42	27.7	4/29/2020
RA-D	320 to 30	44	23.0	1/29/2021
RA-E	280 to 340	56	32.2	4/22/2020 10/7/2020 3/2/2021
RA-F2	130 to 220	55	31.1	4/13/2020

Notes:
1. Wind directions are reported using the "blowing from" convention (e.g., winds from 45° are blowing from the northeast).
mph: miles per hour

The highest recorded wind speeds affecting each remediation area did not exceed the threshold that would trigger monitoring. Figures 1a and 1b present the wind speed data and highlight the peak measured wind speeds in relation to the 50-year return-interval wind speed for 2020 (January to December 2020) and early 2021 (January to May 2021) data, respectively.

Tributary Flow Event Evaluation

During periods of high precipitation or snowmelt, the tributaries to the lake could potentially produce erosive forces on the cap at the mouths of the tributaries due to increased flow velocity. For prior monitoring periods, the lake tributaries included Ninemile Creek, which discharges into Remediation Area (RA)-A; Harbor Brook, which discharges through the Outboard Area into RA-D and RA-E; and Onondaga Creek, which discharges into RA-E.

The U.S. Geological Survey (USGS) gage 04230300, Ninemile Creek at Lakeland, New York, was discontinued effective October 1, 2019. The discontinuation of the gage came as a result of the Onondaga County Department of Water and Environment Protection decision that they are no longer funding this station due to the needs of their program changing. Similarly, USGS gage 04240100, Harbor Brook at Syracuse, New York, was discontinued on October 1, 2020. The USGS gage 04240010, Onondaga Creek at Spencer Street, Syracuse, New York, continues to operate. Due to the discontinuation of two of the three tributary gages, a regression analysis using the remaining operating gage and the last full year of available data from the discontinued gages was used to evaluate if a high flow event was likely to have occurred in one of the tributaries. This approach was

similar to the approach presented in Honeywell's February 10, 2020 letter to the New York State Department of Environmental Conservation regarding the Ninemile Creek USGS Gauge Station Discontinuation (Honeywell 2020), to determine if a 50-year flow event occurred in any of these tributaries. Daily averaged flow rate data were downloaded from the following gage websites maintained by USGS through May 1, 2021 (all available data):

- USGS 04240010, Onondaga Creek at Spencer Street, Syracuse, New York (USGS 2021a) (January 1, 2020, to May 1, 2021)
- USGS 04240300, Ninemile Creek at Lakeland, New York (USGS 2021b) (discontinued)
- USGS 04240100, Harbor Brook at Syracuse, New York (USGS 2021c) (January 1, 2020, to October 1, 2020)

The regression analysis was performed using the daily averaged flow data to determine the flows in Ninemile Creek and Harbor Brook for the periods when these gages were not operational. For the regression analysis to determine Ninemile Creek flows, the daily averaged flow rate dataset for 2018 was used (because it was the last complete dataset), which was then compared to Onondaga Creek daily averaged flow from the same year. Similarly, the last full year of daily mean flow data (2019) were used in the computation of the Harbor Brook flow data after the discontinuation of the gage. The maximum daily averaged flow rates from the measured data and computed flow rates were compared to the 50-year return-interval flow rates for each tributary (as presented in Table 6.4B of the OLMMP). Table 2 summarizes the comparison of the measured and computed flow rate data to the computed 50-year return-interval flow rates.

Table 2
50-Year Event Flow Rates Compared to Maximum Recorded and Computed Flow Rates for January 2020 through May 1, 2021

Tributary/Remediation Area	50-Year Event Flow Rate (cfs)	Maximum Flow Rate for January 2020 to May 1, 2021 (cfs)	Date of Maximum Flow Rate
Onondaga Creek (RA-E)	4,400	843	3/12/2021
Ninemile Creek (RA-A)	3,300	737	3/12/2021
Harbor Brook (Outboard Area, RA-D, RA-E)	800	62.9	5/1/2020

Note:
cfs: cubic feet per second

The threshold extreme flow rates were not exceeded within the monitoring period based on the average daily flow rates recorded at the USGS gage; therefore, cap monitoring was not performed as a result of an event-based trigger. Figures 2a and 2b present the daily average flow rate data and

highlight the maximum flow rate events for each of the tributaries for 2020 and early 2021 data, respectively.

Seismic Event Evaluation

Although a significant earthquake in Central New York State is not common, a large magnitude occurrence could disrupt the cap stability and potentially damage the integrity of the cap layers. An earthquake could also cause differential settlement of the armor layer and layer mixing, resulting in lost integrity of the chemical isolation layer. The USGS Earthquake Hazards Program website data (USGS 2021d) were reviewed to determine if a seismic event of 5.5 or larger on the Richter scale occurred within 30 miles of Onondaga Lake between January 1, 2020, and May 1, 2021. It was determined that there were no seismic events of magnitude 5.5 or larger within 30 miles of Onondaga Lake during this time period.

References

Honeywell, 2020. Letter to: Timothy J. Larson, New York State Department of Environmental Conservation. Regarding: Ninemile Creek USGS Gauge Station Discontinuation. February 10, 2020.

Parsons, 2018. *Onondaga Lake Monitoring and Maintenance Plan*. Prepared for Honeywell. June 2018.

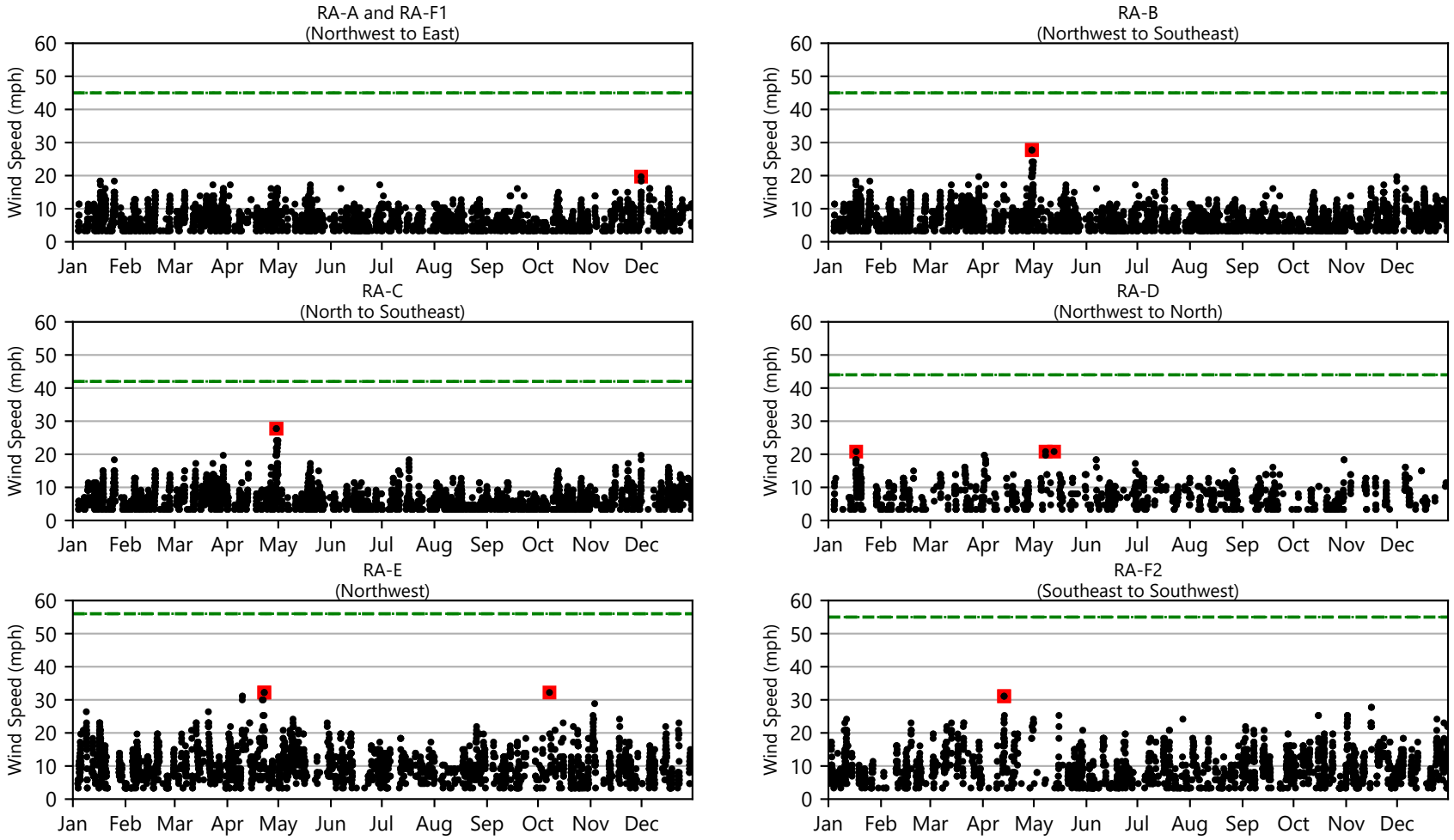
USGS (U.S. Geological Survey), 2021a. "USGS 04240010 Onondaga Creek at Spencer Street, Syracuse NY." *National Water Information System: Web interface*. Last modified: May 1, 2021; accessed May 1, 2021. Available at: https://waterdata.usgs.gov/nwis/uv?site_no=04240010.

USGS, 2021b. "USGS 04240300 Ninemile Creek at Lakeland NY." *National Water Information System: Web interface*. Last modified: May 1, 2021; accessed May 1, 2021. Available at: https://waterdata.usgs.gov/nwis/uv?site_no=04240300.

USGS, 2021c. "USGS 04240100 Harbor Brook at Syracuse NY." *National Water Information System: Web interface*. Last modified: May 1, 2021; accessed May 1, 2021. Available at: https://waterdata.usgs.gov/nwis/uv?site_no=04240100.

USGS, 2021d. "Earthquakes." *Earthquake Hazards Program*. Last modified: May 1, 2021; accessed May 1, 2021. Available at: https://earthquake.usgs.gov/earthquakes/.

Figures



Notes:
1. Wind data are from Hancock International Airport from January 1, 2020, to December 31, 2020.
2. Wind speeds and direction data were reported hourly from the National Climatic Data Center.
3. Calm winds are excluded from the directional wind speed plotting shown.
4. The maximum recorded hourly wind speed for the monitoring period is highlighted in red.

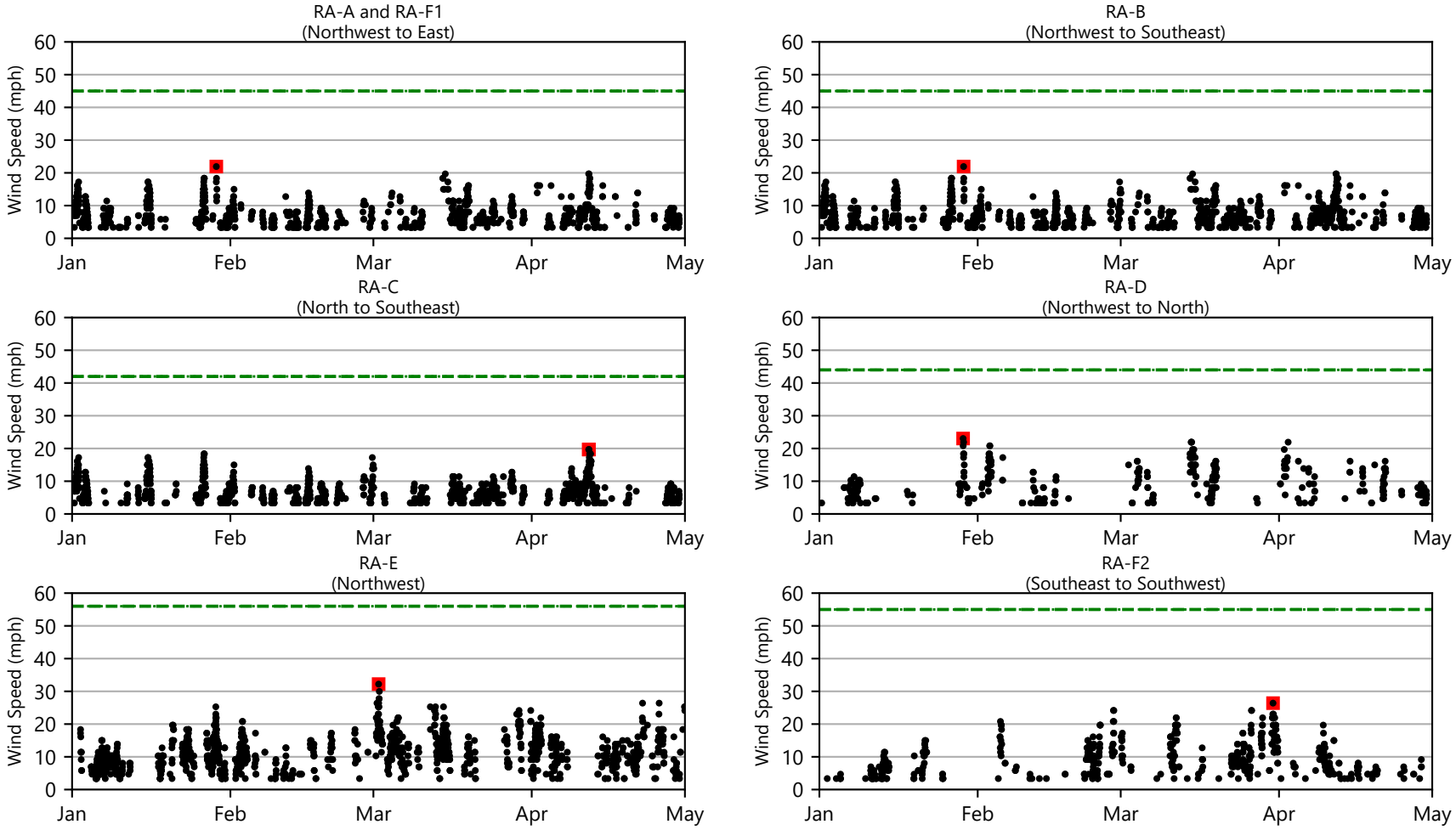
Maximum Recorded Wind Speed
50-Year Event Wind Speed

Publish Date: 07/22/2021 11:05 AM | User: AH
File Path: \\wcl-ny1\helios\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\Wind_and_Wave\results\Monitoring_2021_Memo\NCDC_winddata_processing_Year2020_AH.py

Prepared By: A. Hilton
Reviewed By: K. List

ANCHOR QEA

Figure 1a
Wind Speed Evaluation January 2020 - December 2020
Event-based Monitoring Evaluation
Onondaga Lake Monitoring and Maintenance



Notes:
1. Wind data are from Hancock International Airport from January 1, 2021, to May 1, 2021.
2. Wind speeds and direction data were reported hourly from the National Climatic Data Center.
3. Calm winds are excluded from the directional wind speed plotting shown.
4. The maximum recorded hourly wind speed for the monitoring period is highlighted in red.

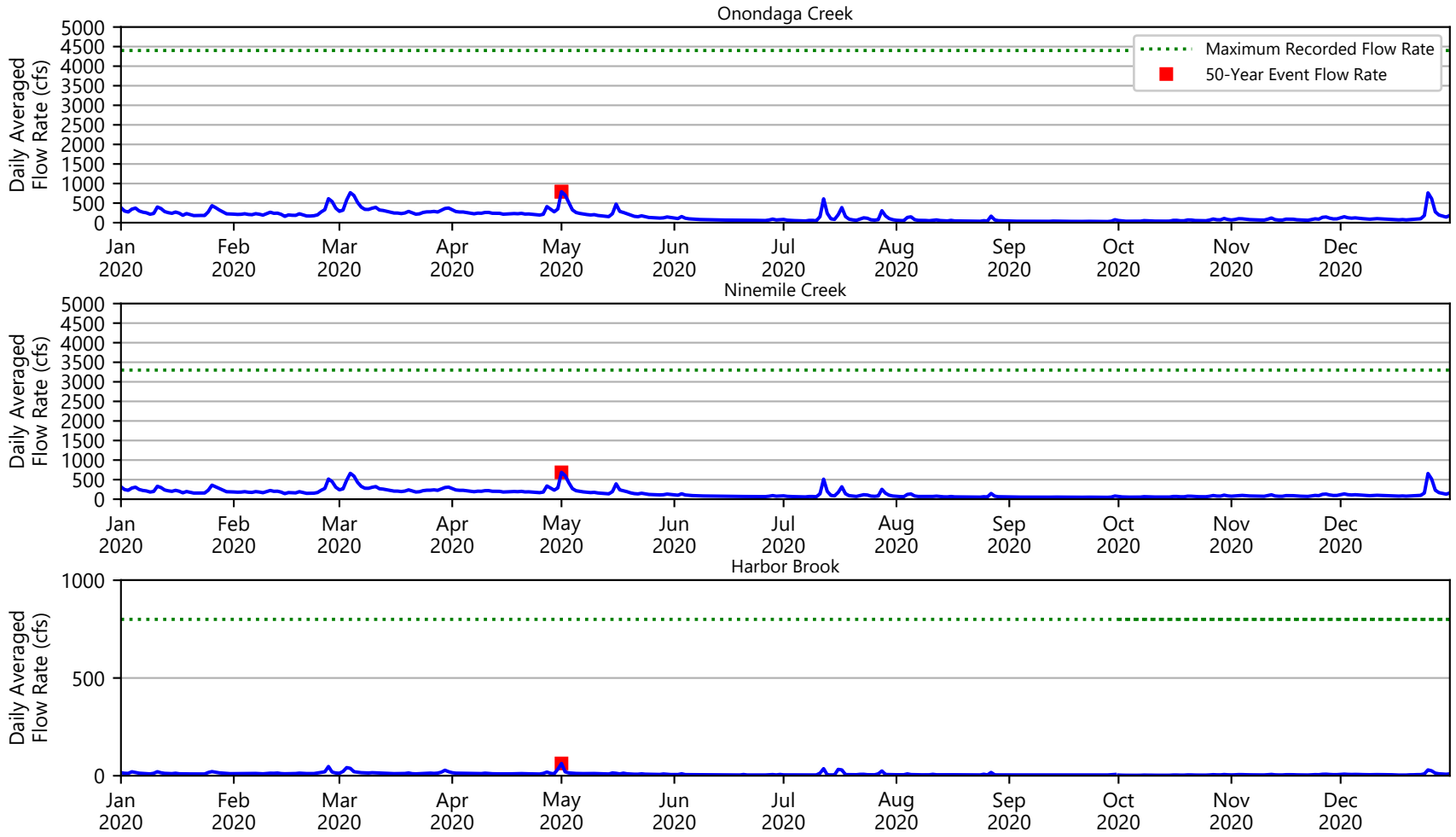
Maximum Recorded Wind Speed
50-Year Event Wind Speed

Publish Date: 07/22/2021 11:02 AM | User: AH
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Prepared By: A. Hilton
Reviewed By: K. List

ANCHOR QEA

Figure 1b
Wind Speed Evaluation January 2021 - May 2021
Event-based Monitoring Evaluation
Onondaga Lake Monitoring and Maintenance



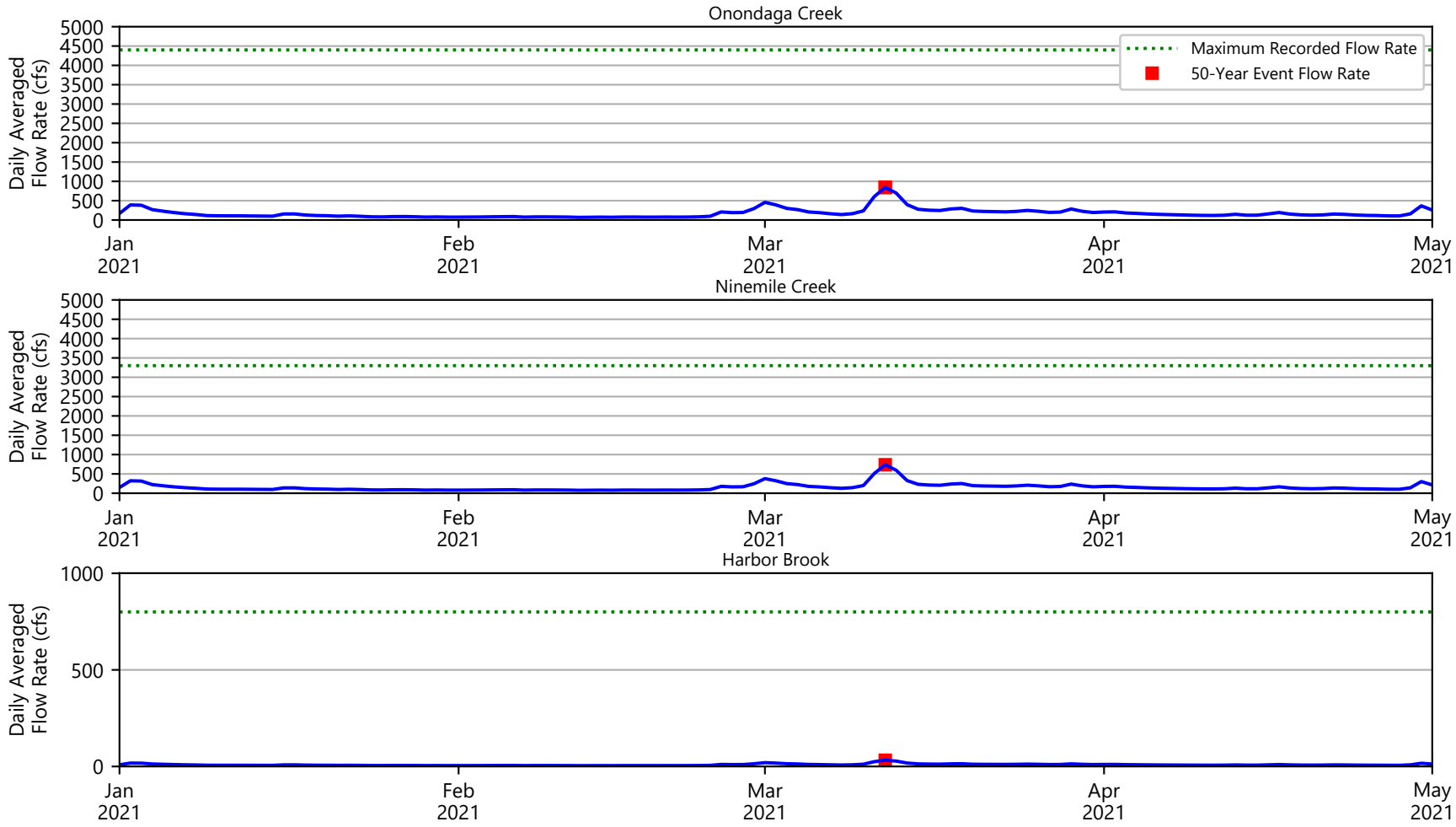
Notes:
1. Flow data are reported as average daily flow rates from each U.S. Geological Survey (USGS) gage station from January 1, 2020, to December 31, 2020.
2. Data Sources: Onondaga Creek: USGS Gage No. 04240010, Ninemile Creek: Based on regression analysis, Harbor Brook: USGS Gage No. 04240100 and regression analysis
3. The maximum daily averaged flow rates for the monitoring period are highlighted in red.
4. The Ninemile Creek USGS gage was discontinued in October 2019, and the Harbor Brook in October 2020. See the monitoring report for more information.

Publish Date: 07/22/2021 11:12 AM | User: AH
File Path: \\wcl-ny1\helios\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\Wind_and_Wave\results\Monitoring_2021_Memo\USGS_flowrate_processing_DailyAvg_Regress-Ninemile.py

Prepared By: A. Hilton
Reviewed By: K. List

ANCHOR QEA

Figure 2a
Tributary Flow Rate Evaluation - January 2020 - December 2020
Event-based Monitoring Evaluation
Onondaga Lake Monitoring and Maintenance



Notes:
1. Flow data are reported as average daily flow rates from each U.S. Geological Survey (USGS) gage station from January 1, 2021, to May 1, 2021.
2. Data Sources: Onondaga Creek: USGS Gage No. 04240010, Ninemile Creek: Based on regression analysis, Harbor Brook: USGS Gage No. 04240100 and regression analysis
3. The maximum daily averaged flow rates for the monitoring period are highlighted in red.
4. The Ninemile Creek USGS gage was discontinued in October 2019, and the Harbor Brook in October 2020. See the monitoring report for more information.

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Prepared By: A. Hilton
Reviewed By: K. List

ANCHOR QEA

Figure 2b
Tributary Flow Rate Evaluation - January 2021 - May 2021
Event-based Monitoring Evaluation
Onondaga Lake Monitoring and Maintenance

APPENDIX 6B - SHORELINE PHOTOS

Pre-Remediation Shoreline (Elev. 362.5')
Shoreline Inspection Area
Shoreline Stabilization
Cap Boundaries

Inspection Date: October 1st, 2020
Water Elevation at Time of Inspection: 363.2'

0 0.25 0.5 1 Miles

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, U

Figure 1

Honeywell

2020 Shoreline Inspection Area

PARSONS
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plot Date: 12/28/2021 Plotted By: Domanski, Joshua

File Name: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\Shoreline Inspection\2020\2020 Shoreline Inspection Photos_Fig1.mxd



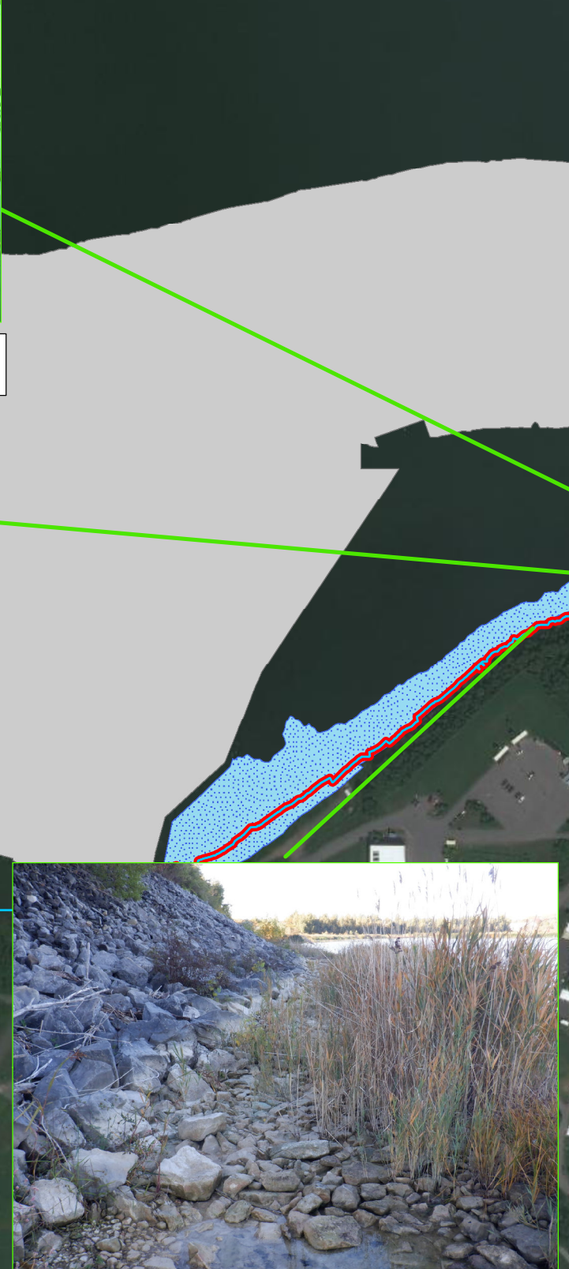
Calcium carbonate precipitation mixed with rotting vegetation.



Staining due to calcium carbonate precipitation along the base of WB 1-8 revetment



Calcium carbonate precipitation mixed with rotting vegetation.



Calcium carbonate staining tapering off in vegetated areas approaching the RAA cap.



First location where staining was noticed along the base of WB 1-8 revetment

Pre-Remediation Shoreline (Elev. 362.5')

Shoreline Inspection Area

Shoreline Stabilization

Cap Boundaries

Inspection Date: October 1st, 2020
Water Elevation at Time of Inspection: 363.2'

0 0.04 0.08 0.16
Miles

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, U

Figure 2

Honeywell

2020 Shoreline Inspection RAA

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plot Date: 12/28/2021 Plotted By: Domanski, Joshua

File Name: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\Shoreline Inspection\2020\2020 Shoreline Inspection Photos_Fig2.mxd



Ditch A outlet, recently completed as part of upland site activities.



Shoreline material placed in the fall of 2019 as part of upland site activities.



Public boat launch for smal craft, between Ditch A and the Visitor's Center.



Visitor's Center observation platform installed as part of upland site activities.



Newly installed public boat launch and dock near the Visitor's Center.

Pre-Remediation Shoreline (Elev. 362.5')

Shoreline Inspection Area

Shoreline Stabilization

Cap Boundaries

Inspection Date: October 1st, 2020
Water Elevation at Time of Inspection: 363.2'

0 0.02 0.04 0.08
Miles

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, U

Figure 3

Honeywell

2020 Shoreline Inspection
RAC

PARSONS
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plot Date: 12/28/2021 Plotted By: Domanski, Joshua

File Name: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\Shoreline Inspection\2020\2020 Shoreline Inspection Photos_Fig3.mxd



Deposition of fine gravel material along the northern face of Berm A. Likely due to movement of the habitat layer along the shoreline west of the berm.



Loss of vegetation and potential topsoil erosion between Berms B and C



Erosion of fine gravel habitat material along the RAD shoreline. Material was placed along this area in 2019 to address prior material loss.



Loss of vegetaton and potential topsoil erosion between Berms B and C



Deposition of fine gravel material at the end of Berm A. Likely due to movement of the original habitat layer along the shoreline west of the berm.

Pre-Remediation Shoreline (Elev. 362.5')

Shoreline Inspection Area

Shoreline Stabilization

Cap Boundaries

Inspection Date: October 1st, 2020
Water Elevation at Time of Inspection: 363.2'

0 0.04 0.08 0.16 Miles

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, US

Figure 4

Honeywell

2020 Shoreline Inspection
RAD

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plot Date: 12/28/2021 Plotted By: Domanski, Joshua

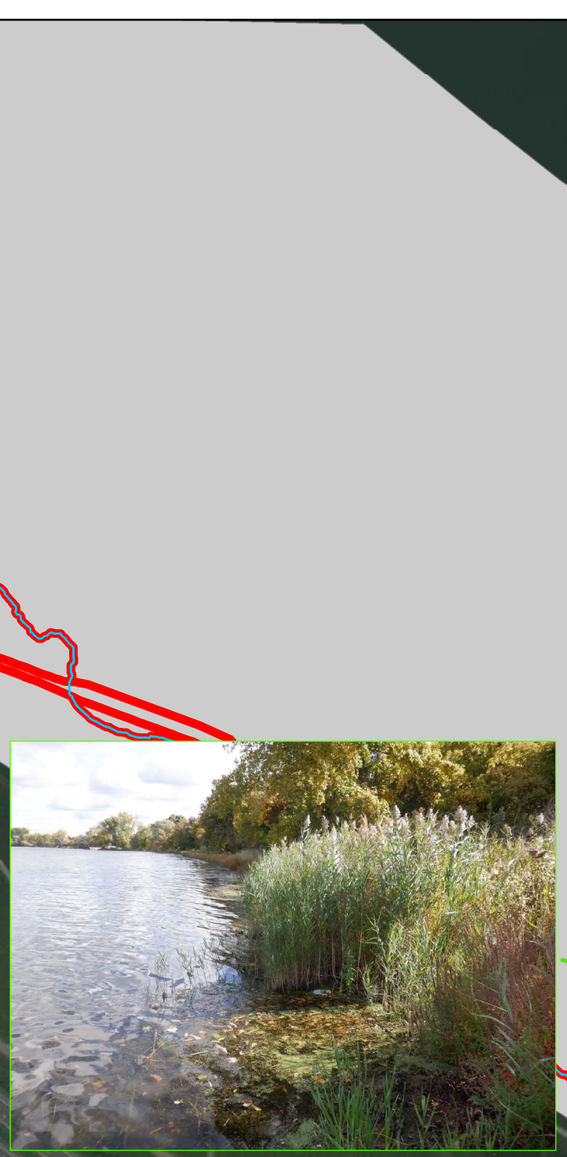
File Name: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\Shoreline Inspection\2020\2020 Shoreline Inspection Photos_Fig4.mxd



View of vegetation and shoreline features.



Light gray substrate along the CSX Shoreline, outside of the remediation area. It appears as if the high wave action in these areas eroded sediment that originally covered the material.



View of vegetation and shoreline features.

Pre-Remediation Shoreline (Elev. 362.5')
Shoreline Inspection Area
Shoreline Stabilization
Cap Boundaries

Inspection Date: October 1st, 2020
Water Elevation at Time of Inspection: 363.2'

0 0.04 0.08 0.16 Miles

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, US

Figure 5

Honeywell

2020 Shoreline Inspection
RAE

PARSONS
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plot Date: 12/28/2021 Plotted By: Domanski, Joshua

File Name: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\Shoreline Inspection\2020\2020 Shoreline Inspection Photos_Fig5.mxd

APPENDIX 6C - AERIAL PHOTOS

APPENDIX 6C - AERIAL PHOTOS

AMPHITHEATER PHOTOS







RA-A PHOTOS





RA-D OUTBOARD AREA PHOTOS

















































ATTACHMENT 1 – 2020 ANNUAL POST CLOSURE CARE SUMMARY REPORT FOR THE ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA (SCA)

2020 ANNUAL POST CLOSURE CARE SUMMARY REPORT FOR THE ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA (SCA) TOWN OF CAMILLUS ONONDAGA COUNTY, NEW YORK

Prepared For:

Honeywell

301 Plainfield Road
Suite 330
Syracuse, New York 13212

Prepared By:

PARSONS

301 Plainfield Road
Suite 350
Syracuse, New York 13212

DECEMBER 2021

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LIST OF ACRONYMS

LMS	Liquid management system
LTS	Liquid transmission system
Metro	Onondaga County Metropolitan Wastewater Treatment Plant
NRD	Natural Resources Damages
NYSDEC	New York State Department of Environmental Conservation
PCCP	Post-Closure Care Plan
Q1, Q2, Q3, Q4	First, second, third and fourth quarters, respectively
ROD	Record of Decision
SCA	Sediment Consolidation Area
SOW	Scope of work
USDC	United States District Court
USFWS	United States Fish and Wildlife Service

EXECUTIVE SUMMARY

The Sediment Consolidation Area (SCA) final cover system was completed in October 2017. The 2020 monitoring and maintenance activities were completed consistent with the SCA Post-Closure Care Plan (PCCP) (Parsons and Beech and Bonaparte 2017), with the objective of maintaining and verifying the integrity and effectiveness of the cover system, surface water management system, liquid management system (LMS), and SCA perimeter berm.

Monitoring activities included:

- Quarterly visual inspections of the SCA final cover system and of the surface water management system
- Monthly inspections of the LMS system
- Monthly Odor monitoring
- Additional inspections after major storm events and prior to mowing events

Maintenance activities (i.e., mowing, seeding, and invasive species control) were conducted as needed based on inspection findings.

Throughout the 2020 monitoring period, the systems were observed to be in good condition and were performing as intended. As recommended in the *2019 Annual Post-Closure Care Summary Report for the Onondaga Lake Sediment Consolidation Area (SCA)* (Parsons 2021), repairs on small animal burrows at the base of several gas vents were performed in 2020 (see Section 3 for more details). The site was also monitored during inspections for any needs of supplementary seeding (areas with sparse vegetation were very minor and field observations determined enhancement seeding was not warranted in 2020).

During this monitoring period, the PCCP implemented at the SCA has been effective, and the program will continue as planned in 2021. Additional recommendations for 2021 include:

- Repair small animal burrows identified at gas vent locations during the last two quarters of 2020 (and perform wildlife management prior to the repairs).
- In spring 2021, evaluate the need for further application of supplementary seed in areas identified as having sparse vegetation during the 2020 quarterly inspections.

1.0 INTRODUCTION

The Onondaga Lake Bottom Site, located near Syracuse in Central New York, is on the New York State Registry of Inactive Hazardous Waste Sites and is part of the Onondaga Lake National Priorities List. Honeywell entered into a Consent Decree (United States District Court, Northern District of New York [USDC] 2007) (89-CV-815) with the New York State Department of Environmental Conservation (NYSDEC) to implement the selected remedy for Onondaga Lake as outlined in the Record of Decision (ROD) issued on July 1, 2005 (NYSDEC 2005).

As specified in the ROD, a component of the selected lake remedy included dredging and on-site consolidation of sediments removed from the lake. Based on an evaluation of potential locations the SCA was constructed on Wastebed 13 to contain sediment dredged from Onondaga Lake (Figure 1) in 2010, 2011, and 2012.

The approximately 55-acre SCA site was constructed in two phases. Two adjacent stormwater basins, the East Basin and the West Basin, occupy approximately four acres and 2.4 acres, respectively (Parsons and Anchor QEA

2017). The Onondaga Lake SCA Civil and Geotechnical Final Design Report (Parsons and Geosyntec 2011) describes the SCA liner system and perimeter berm design.

Dredging operations in Onondaga Lake and sediment transport to the SCA began in 2012 and were completed in November 2014. The Onondaga Lake SCA Final Cover Design Report (Parsons and Beech and Bonaparte 2016) describes the SCA final cover system design. Construction of the cover system began in 2015 and was completed in 2017. The final cover consisted of a leveling layer, a protective cover layer, and a vegetative layer for restoration of native grassland species. The site layout is shown in Figure 2.

In addition to the above activities, the habitat quality of the vegetative cover of the SCA site was enhanced to meet the requirements set forth in paragraph 27 of the Natural Resource Damages (NRD) Consent Decree (USDC 2018). The scope of work (SOW) for this project (NRD SOW Project #6, "Native Grasslands Project") is defined in the NRD Consent Decree. The SOW is overseen by the Onondaga Lake NRD Trustees Council, which is comprised of the New York State Commissioner of Environmental Conservation and United States Department of the Interior, represented by the NYSDEC and the United States Fish and Wildlife Service (USFWS). As discussed in the Onondaga Lake Natural Resource Restoration Projects 2020 Annual Report (Parsons 2020), activities performed at the site as part of the NRD Native Grasslands Project in 2020 included minor soil repairs and supplementary seeding (see Section 3).

This report consists of five sections. Following this introduction, Section 2 describes the findings of the various inspections and monitoring events completed at the site during the 2020 monitoring period. Section 3 summarizes maintenance and enhancement activities conducted at the site during the monitoring period. Section 4 provides recommendations for continued post-closure care in 2021 and outstanding maintenance items noted during the 2020 quarterly inspections. Finally, Section 5 lists references cited in the report.

2.0 SITE INSPECTIONS AND MONITORING

The following describes inspections and monitoring events conducted at the site during 2020 as required by and outlined in the PCCP. These include visual inspections of the SCA final cover system, visual inspections of the surface water management, soil erosion, sediment control structures, the LMS, and environmental monitoring. Site features are depicted on Figure 2.

2.1 SCA Final Cover System

Quarterly visual inspections of the SCA final cover system were completed in March, May, July, and October 2020. The objective of the final cover system inspections was to verify that the final cover system was continuing to prevent direct contact with the underlying materials and off-site transport of contaminated media. The final cover system was visually examined for the following:

- Evidence of subsidence or settling that results in low points or depressions
- Evidence of burrowing animals
- Evidence of trespassing or unauthorized use of the final cover area
- Presence of erosion rills
- Condition of vegetation (e.g., grass)
- Observable irregularities such as bulges, bumps, slumps, or cracks
- Evidence of ponded water
- Condition of gas vents

- Condition of drainage pipe outlets
- Condition of access roads (i.e., erosion, aggregate washout, exposed geotextile, and debris on the road)
- Condition of SCA perimeter berm
- Condition of areas near anchor trenches
- Other irregularities

During quarterly inspections, vegetation throughout the cover area was observed with a good density and diversity of native grassland species, which have established a solid root structure that prevents erosion. Both cool weather and warm weather species were identified during inspections. Common species included Virginia wildrye (*Elymus virginicus*), smooth panic grass (*Panicum dichotomiflorum*) and switchgrass (*Panicum virgatum*). Signs of minor erosion rills and small areas of sparse vegetation were documented during 2020 quarterly inspections. Erosion rills seeded during 2019 inspections were monitored throughout 2020 and remained stable and vegetated.

No sediment accumulation was observed within swales and downchutes during 2020 inspections. Woody plants were identified in the northwest downchute in the first quarter (Q1) of 2020 and the west downchute in the second quarter (Q2); these were removed in the fall.

The access road remained in good condition, and the gas vents (and their surroundings)showed no signs of debris or sediment accumulation.

In Q1 and Q2 of 2020, evidence of animal burrowing was noted in the proximity of several gas vents. These were inspected for small animals and filled in during the third quarter (Q3) inspection. Additional small animal burrows were identified again in the fourth quarter (Q4) and will be repaired in 2021; animal control will be carried out prior to the repairs.

Minor pooling was only noted during the Q1 inspection and was likely due to snow melt.

Appendix A includes maps summarizing findings for each quarterly inspection during the monitoring period.

The PCCP requires additional visual inspections be conducted as soon as practical after major storm events, possible flooding events, or other events that may result in damage to the final cover system. No additional inspections were required in 2020 as storm events coincided with scheduled quarterly inspections.

2.2 Surface Water Management, Soil Erosion, and Sediment Control Structures

Visual inspections of the surface water management systems, temporary soil erosion features, and sediment control structures were completed quarterly as specified by the PCCP. Permanent surface water management structures include diversion berms, interception berms, drainage channels, and the East and West Basins (including temporary pumps and pipes). The purpose of these inspections was to visually examine and evaluate the integrity and proper function of these structures.

Throughout the 2020 monitoring period, surface water management, soil erosion, and sediment control structures were found to be in good condition.

Appendix A contains quarterly inspection report packages describing structure conditions.

2.3 Liquid Management System

The LMS includes a liquid transmission system (LTS) and two sumps for collecting and removing liquid through two vertical risers at each sump location. Liquid enters the risers via sumps by gravity flow. The riser pumps were designed either to turn on and off automatically based on the liquid levels within the risers or to be operated manually. However, the pumps are operated manually two to three times a week as discussed below. The LTS transfers liquid to the SCA wastewater treatment plant (WTP) for pretreatment of the SCA effluent prior to discharge to the Onondaga County Department of Water Environment Protection Metropolitan Wastewater Treatment Plant (Metro). Pretreatment of the SCA effluent includes removal of metals, solids, and volatile and semi-volatile organic compounds (VOCs and SVOCs). The pretreated water receives enhanced ammonia removal at Metro. The WTP includes facilities for pH adjustment, chemical addition of a coagulant, clarification, carbon adsorption, and effluent monitoring. The multi-train system has been reduced to a single train since completion of dredging in 2015 with the reduced flow of water from the SCA. The treatment train includes metals precipitation through pH adjustment and addition of alum/polymers, sludge thickening and separation in inclined plate clarifiers (IPC), and removal of organics with liquid-phased granular activated carbon (LGAC) units. Thickened sludge from the clarifiers is discharged to a sludge holding tank within the WTP and periodically shipped for offsite disposal. In 2020, influent was treated in batch mode, typically 2 to 3 days per week based on sump levels that are continuously monitored at Willis WTP. Typical maintenance activities include:

- Effluent flow meter calibration quarterly
- pH probe calibration twice per month with a third party calibration completed quarterly.
- Air compressor maintenance
- Periodic GAC sampling to monitor for VOC breakthrough
- Clarifier plate cleaning
- Pump maintenance
- Heater maintenance

Continuing from previous years, LMS inspections were conducted monthly throughout 2020. Inspections included the following elements:

- Verification that the automatic controls of the pumps are operational when the water treatment plant is ready to operate[1]
- Examination of the condition of instrumentation and/or valves (e.g., sticking or jammed devices, corrosion, leaks, and misalignments) and that the liquid removal process is functioning properly
- Verification that the operating conditions of the LMS are specified so that the liquid depth in the sump does not exceed six feet
- Verification that liquid is flowing from the sumps during pumping
- Recording of the flow rate and volume of liquids flowing from the sumps
- Confirmation that the pumps are operating and that high-level alarm conditions have not been reached
- Examination of the condition of the aboveground piping (including pipes at the top of the riser as well as the LTS piping) and the insulation around the pipes while pumping activities are occurring
- Verification that appropriate warning signage is clearly visible on-site (e.g., buried live electric line, liquid transmission pipe)
- Examination of the condition of mechanical and electrical instrumentation devices in winter prior to system startup in automatic mode (including verification that device heaters are in working order and the drains of the sump pump discharge piping are closed)

[1] With the reduced leachate flow, pumping and treatment operations are done in batch mode. Operations are short in duration and are conducted manually.

- Examination of the condition of the sump riser covers

The PCCP requires additional inspections to be conducted should a remote monitoring system become inoperable. No additional inspections were required in 2020.

All LMS inspections conducted during 2020 found equipment to be in working order. Appendix A packages include inspection forms for each LMS inspection conducted by Jacobs during 2020. Table 1 includes monthly summaries of sump elevation and volume pumped associated with each LMS during the monitoring period. Table 2 includes monthly summaries of the West and East Basin elevation and discharge volumes pumped to Outfall 18 from the East Basin.

2.4 Environmental Monitoring

Vent odor monitoring was conducted once per month in 2020, as approved by the NYSDEC on September 27, 2018. Monitoring consisted of odor observations at eight air monitoring stations, located along the SCA work zone perimeter road (Figure 1). Monitoring was completed by a qualified individual who has experience with site-related odors. As summarized on Table 3, no site-related odors were detected during the 2020 monitoring period inspections.

3.0 MAINTENANCE AND ENHANCEMENTS

The following summarizes maintenance and enhancement efforts conducted at the site during 2020, as required in the PCCP and the NRD SOW. Only small pockets of sparse vegetation were observed during the quarterly inspections of the final cover area, requiring no additional seeding at this time. Site condition observations and field notes were recorded in the quarterly inspections (see Appendix A), and will be used as a reference for future enhancement seeding or repair recommendations.

Gas Vent Burrow Repair

As recommended in the 2019 Post Closure Care Summary Report (Parsons 2021), repairs on small animal burrows at the base of several gas vents were performed. During the Q3 quarterly inspection, small animal burrows observed during Q1 and Q2 inspections were filled in and repaired with topsoil. All burrows were first inspected to remove any animals before repairs occurred. Following repairs, each filled burrow was seeded with oats (*Avena sativa*).

Mowing

Following the PCCP guidelines, a cover inspection was performed in early April 2020, which determined that soft and muddy conditions were not ideal for mowing and spring mowing was cancelled. Mowing activities were completed in the week of October 5 following PCCP requirements, with the mower blade height set to 10 inches. The diversion/interception berms were hand cut to avoid potential damages to the berms and due to safety concerns regarding the use of the mower on the berms. Mowed areas surrounding vents were inspected following the completion of mowing, and no impacts to the gas vents were noted. Given no woody plants were identified adjacent to the gas vents during the quarterly inspections, no hand trimming was needed around the vents.

4.0 SUMMARY AND RECOMMENDATIONS

Conditions and operation of the SCA site during the 2020 monitoring period were satisfactory. Results from PCCP monitoring implemented at the SCA site verify the remedy remains effective. The following monitoring activities are recommended for 2021:

- Continue SCA site monitoring and maintenance activities as described in the PCCP.
- Conduct repairs on new small-animal burrows noted at the base of gas vents in Q4 2020 (Appendix A).
- Evaluate the need for supplementary seed dispersal in small areas with sparse cover identified during the 2020 quarterly inspections (Appendix A).
- Evaluate the need for repairs in erosion rills identified during the 2020 quarterly inspections (Appendix A).
- Reduce the frequency of LTS and odor monitoring.

5.0 REFERENCES

NYSDEC, 2005. *Record of Decision Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site.* Prepared by the New York State Department of Environmental Conservation and the United States Environmental Protection Agency. July 2005.

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TABLES

Honeywell

PARSONS

TABLE 1 LEACHATE MANAGEMENT SUMMARY

Month	West Sump			East Sump		
	Sump Elevation (inches)[1] Max. Elev. 72in.	Average Discharge pumped to WTP (average gal/day)	Total Discharge pumped to WTP (gal/month)	Sump Elevation (inches)[1] Max. Elev. 72in.	Average Discharge pumped to WTP (average gal/day)	Total Discharge pumped to WTP (gal/month)
2020						
January	42.1	3,500	56,006	36.9	2,061	32,970
February	42.4	2,982	47,704	37.8	1,746	27,931
March	42.4	2,692	61,927	37.3	1,546	35,565
April	41.8	2,988	65,727	36.8	1,682	37,009
May	41.3	2,924	61,406	36.6	1,621	34,050
June	40.8	2,760	52,445	36.5	1,607	30,527
July	40.6	2,637	58,015	36.6	1,560	34,322
August	39.8	2,361	51,932	36.0	1,375	30,249
September	42.0	3,290	52,646	37.7	2,033	32,528
October	43.4	3,716	52,023	39.4	2,345	32,828
November	44.6	3,519	49,266	38.9	2,155	28,017
December	30.9	3,571	57,129	27.8	2,102	33,632

[1] Values are reported as monthly average. Maximum elevation limit is set for the liquid depth in the sump to not exceed 6 feet (as stated in the PCCP).

Honeywell

PARSONS

TABLE 2 STORMWATER MANAGEMENT SUMMARY

Month	West Basin	East Basin	Average Stormwater Discharge to Outfall 18 (average gal/month)	Total Stormwater Discharge to Outfall 18 (gal/month)
	Elevation (inches) [1] Max. Elev. 72in.	Elevation (inches) [1] Max. Elev. 85.2in.		
2020				
January	68.1	73.9	302,204	4,533,065
February	63.4	77.3	193,948	3,103,165
March	70.3	72.7	208,216	2,915,021
April	53.1	71.9	197,798	3,164,773
May	39.5	61.2	189,185	2,648,592
June	60.4	59.3	-[2]	-[2]
July	52.2	72.0	162,829	1,791,124
August	51.8	58.2	-[2]	-[2]
September	67.7	58.2	-[2]	-[2]
October	39.4	65.2	109,341	1,421,436
November	58.0	67.4	56,174	505,567
December	52.8	70.9	183,239	2,931,816

[1] Values are reported as monthly average. Maximum elevation limit is set to reduce risk of stormwater backing onto cover.

[2] During these months, no stormwater discharge to OF 18 occurred.

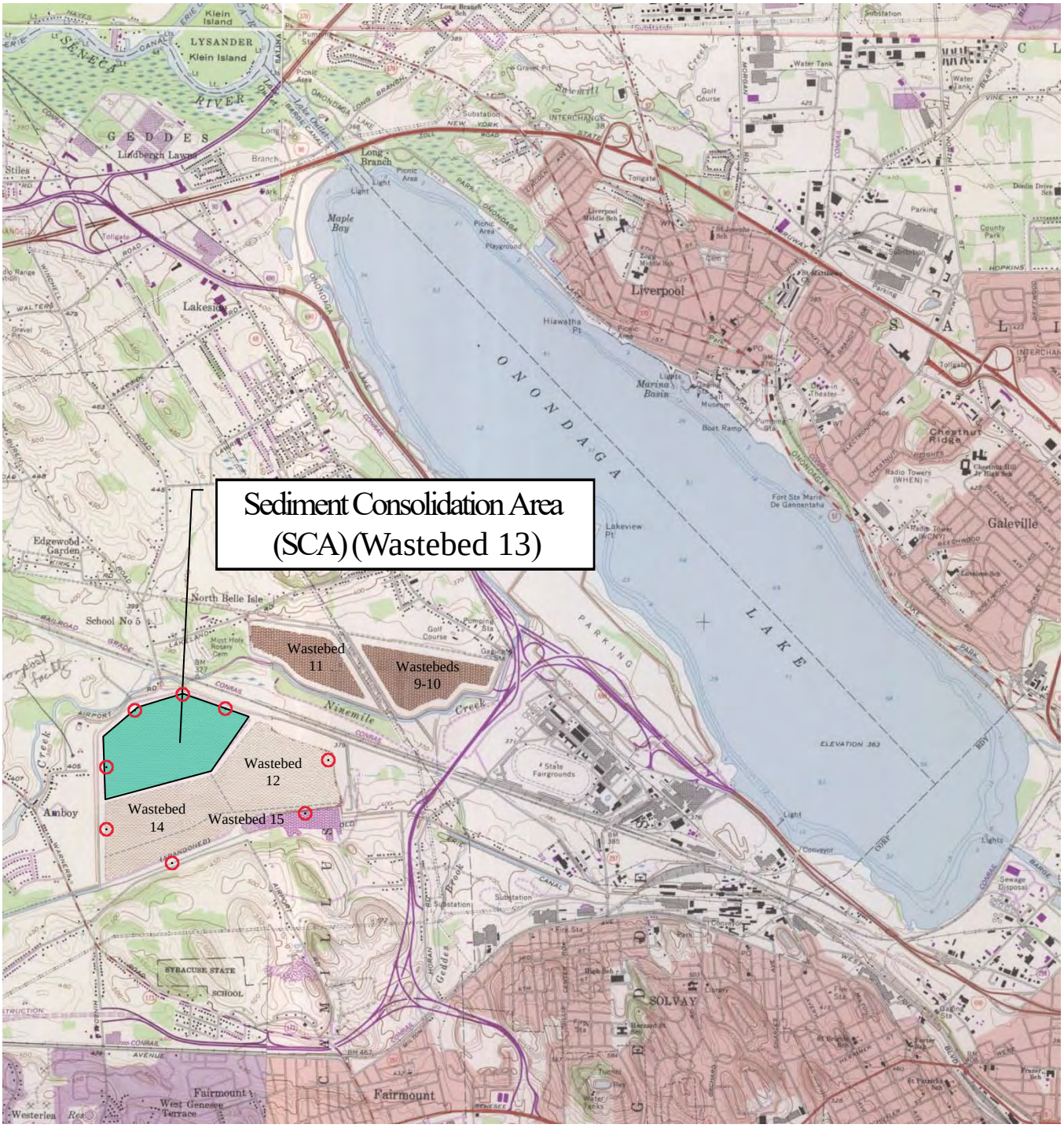
Honeywell

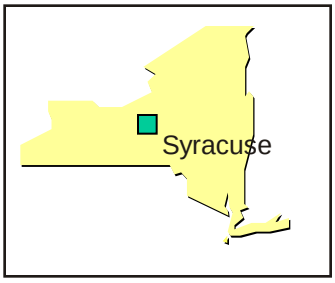
PARSONS

TABLE 3 ENVIRONMENTAL MONITORING SUMMARY - ODOR OBSERVATIONS

2020	
Date	Odors Y/N
1/27/2020	N
2/27/2020	N
3/31/2020	N
4/15/2020	N
5/20/2020	N
6/22/2020	N
7/13/2020	N
8/14/2020	N
9/15/2020	N
10/16/2020	N
11/24/2020	N
12/18/2020	N

FIGURES





New York
Quadrangle

LATITUDE: N 43° 5' 57"
LONGITUDE: W 76° 10' 41"

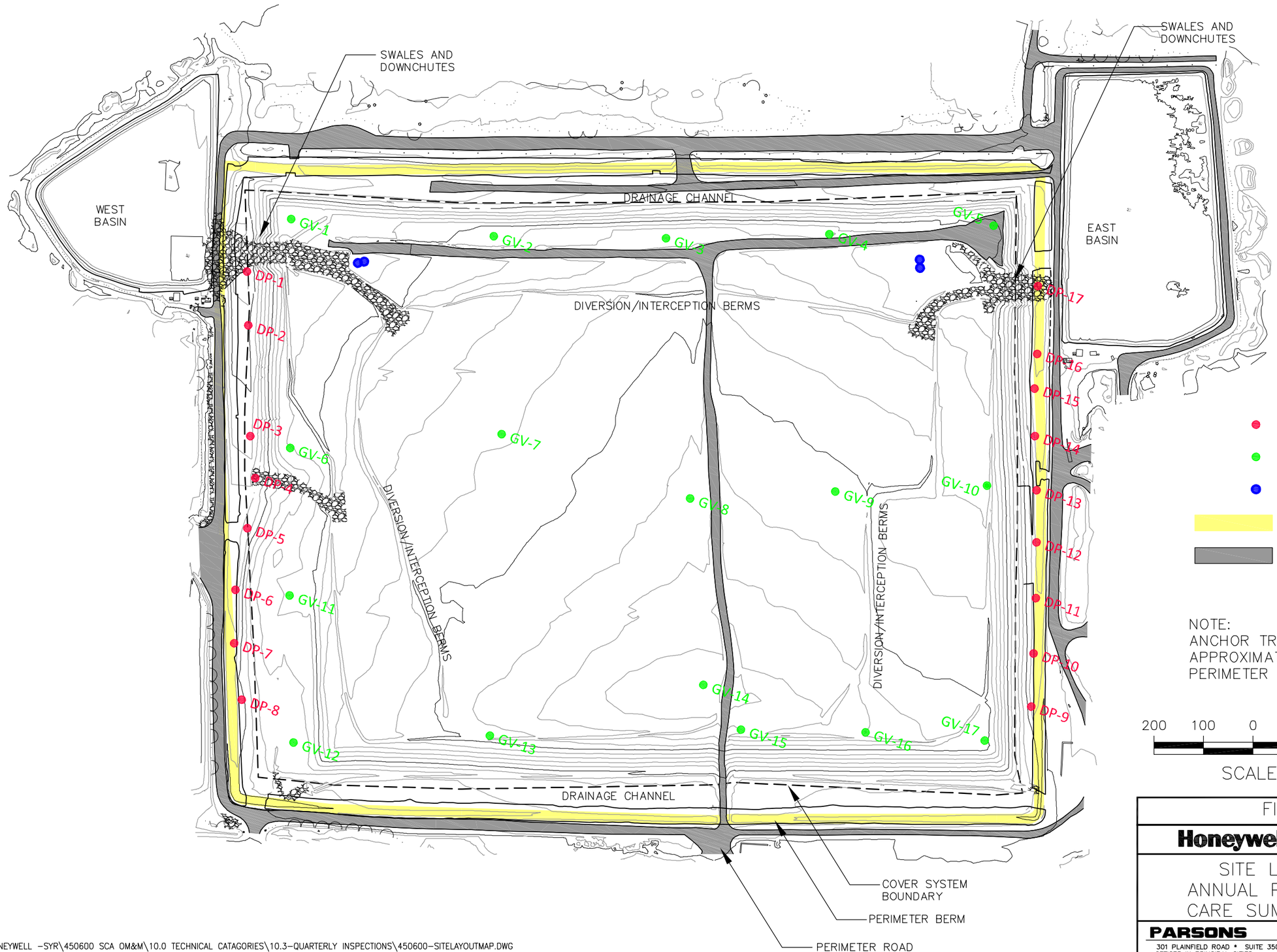
N

SOURCE: U.S.G.S.
SYRACUSE WEST
QUADRANGLE

FIGURE 1

Site Location Map
Annual Post-Closure Care Summary Report

⊙ Odor Monitoring Locations



LEGEND:

- DRAINAGE PIPE OUTLET
- GAS VENT
- SUMP/RISERS
- PERIMETER BERM
- ROAD

NOTE:
ANCHOR TRENCH LOCATION APPROXIMATELY FOLLOWS PERIMETER ROAD.

200 100 0 200 400

SCALE: 1"=200'

FIGURE 2

Honeywell SCA SYRACUSE, NY

SITE LAYOUT MAP
ANNUAL POST-CLOSURE CARE SUMMARY REPORT

PARSONS
301 PLAINFIELD ROAD • SUITE 350 • SYRACUSE, NY 13212 • 315/451-9560
OFFICES IN PRINCIPAL CITIES

FILE NAME: P:\HONEYWELL -SYR\450600 SCA OM&M\10.0 TECHNICAL CATAGORIES\10.3-QUARTERLY INSPECTIONS\450600-SITELAYOUTMAP.DWG
PLOT DATE: 9/27/2021 7:35 AM PLOTTED BY: MORANZ, KAITLYN

APPENDIX A INSPECTION, OPERATION, AND MAINTENANCE FORMS – QUARTERLY INSPECTION PACKAGES

2020 Q1 SCA Quarterly Inspection Package
Inspection, Operation, and Maintenance Forms

The 2020 Quarter 1 SCA inspection was completed on March 2, 2020. During the inspection the following items were evaluated:

- evidence of trespassing or unauthorized use of the final cover area
- evidence of subsidence or settling that results in low spots, or presence of erosion rills
- evidence of burrowing animals
- condition of vegetation
- observable irregularities such as bulges, bumps, slumps, or cracks
- evidence of ponded water
- condition of gas vents and drainage pipe outlets
- condition of access roads (i.e., erosion, aggregate washout, exposed geotextile, and debris on the road)
- condition of SCA perimeter berm
- condition of areas near anchor trenches, storm water control berms, and drainage channels

Overall, the site was found in good condition and there were no major irregularities to note. Ground cover and tall grasses have entered seasonal senescence due to snow and cold temperatures, and dried cover remains present around the vents. Minor signs of superficial erosion were noted near the toe of slope and on the eastern edge of the RECP installed in 2019 and will continue to be monitored throughout 2020. Only a few, small, isolated locations along berms remain with sparse vegetation. Small woody plants were identified in the NW downchute and W downchute in previous quarters and were removed. Few small woody plants have grown in the NW downchute, and their removal is planned in 2020.

The gas vents and drainage pipes were in good condition, as were the berms and drainage channels around the perimeter of the landfill. Evidence of small animal burrows were noted near gas vents GV-2, GV-3, GV-4, GV-6, GV-10, GV-14, GV-15, and GV-16. Additional small animal burrows were noted near GV-6 and between GV-3 and GV-4. Wildlife management will be performed prior to the repair of these small burrows (to be completed in 2020). No cap irregularities were observed. A small area of daylighting was noted to the North of the W downchute. A small pool, likely created from snowmelt, was noted on the southern side of the E downchute and will be monitored in future site visits.

Attachments to this package include completed field forms associated with this quarterly inspection, a photo log documenting the general condition of the gas vents cover, and monthly LMS inspection forms completed by Jacobs during this quarter. A figure with site condition observations and field notes has been included and will be used as reference for potential future enhancement seeding and RECP recommendations.

QUARTERLY FORMS & SITE RECON FIGURE

Honeywell

PARSONS

3-2-2020 GENERAL RECON		
ITEM	Y/N	COMMENT
Evidence of trespassing/ unauthorized use of final cover area	N	n/a
Evidence of subsidence or settling/ low points/ depressions	N	n/a
Evidence of burrowing animals	Y	Small animal burrows noted at the bases of GV-2, GV-3, GV-4, GV-6, GV-10, GV-14, GV-15 and GV-16. Additional burrows noted close to GV-6 and between GV-3 and GV-4. Wildlife management planned prior to repairs.
Presence of erosion rills	Y	Very minor signs of superficial erosion were noted near RECP placed in 2019.
Vegetation performing as intended	Y	Seasonal senescence of plants. Some tall grasses noted around gas vents.
Irregularities such as bulges, bumps, slumps or cracks observed	N	n/a
Evidence of ponded water	Y	Minor pooling noted on southern side of east swale.
Condition of access roads good (no aggregate washout, exposed geotextile, etc.)	Y	Good condition
Perimeter berm in good condition	Y	Seed germination was noted in locations seeded in Q2 2019. Some sparse vegetation was noted on berms. Area will continue to be monitored.
Proper function and integrity of diversion berms	Y	
Proper function and integrity of interception berms	Y	
Proper function and integrity of drainage channels	Y	Good condition. A few small woody plants were present in NW downchute.
Proper function and integrity of East & West Basin	Y	n/a

Honeywell

PARSONS

3-2-20 GAS VENT LOCATIONS	
#	CONDITION (Gas vent structural integrity, plantings, cap irregularities)
GV-1	Vent straight and in good condition (gas vent cap found loose and was re-attached). Medium height grasses present.
GV-2	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-3	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-4	Vent straight and in good condition. Cap intact. Medium height grasses present. Small animal burrows present.
GV-5	Vent straight and in good condition. Cap intact. Medium height grasses present.
GV-6	Vent in good condition with a slight lean (consistent with previous recon)*. Cap intact. Small grasses present.
GV-7	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-8	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-9	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-10	Vent straight and in good condition. Cap intact. Medium height grasses present. Animal burrow present.
GV-11	Vent straight and in good condition. Cap intact. Medium height grasses present.
GV-12	Vent in good condition with a slight lean (consistent with previous recon)* Cap intact. Small grasses present.
GV-13	Vent in good condition although tilted (consistent with previous recon)*. Cap intact. Medium height grasses present.
GV-14	Vent straight and in good condition. Cap intact. Tall grasses present. Animal burrows present.
GV-15	Vent in good condition with a very slight lean (consistent with previous recon)*. Cap intact. Tall grasses present. Small animal burrows present.
GV-16	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-17	Vent in good condition with a very slight lean (consistent with previous recon)*. Cap intact. Medium height grasses present.

* Vents noted with a tilt/lean are consistent with previous monitoring observations and do not require any improvements or changes. All vents are functioning as intended.

Honeywell

PARSONS

3-2-20 Drainage Pipe Daylight Locations			
#	COORDINATES		COMMENTS
DP-1	1120202.677	905912.700	Under chute riprap, not visible
DP-2	1120100.239	905948.459	Good condition, slightly visible, moderate vegetation surrounding drainage pipe
DP-3	1119888.374	906021.590	Not visible, covered with water
DP-4	1119811.170	906056.949	Under drainage downchute riprap, not visible
DP-5	1119709.306	906072.849	GPS coordinates ~10 ft. upslope of toe, could not find
DP-6	1119583.469	906088.100	Good condition, slightly visible, covered with water
DP-7	1119479.886	906118.916	Good condition, visible, small vegetation surrounding drainage pipe
DP-8	1119376.185	906168.548	GPS coordinates ~10 ft. upslope of toe, could not find
DP-9	1119852.555	907690.460	3 ft. off from GPS coordinates; Good condition, visible, moderate vegetation surrounding drainage pipe
DP-10	1119956.045	907661.695	Good condition, slightly visible, covered with water and moss
DP-11	1120063.765	907631.793	Good condition, visible, moderate vegetation surrounding drainage pipe
DP-12	1120171.762	907598.511	Good condition, slightly visible, moderate vegetation surrounding drainage pipe, covered with moss, water flowing out from pipe
DP-13	1120271.798	907566.212	Good condition, slightly visible, thick vegetation surrounding drainage pipe, water flowing out from pipe
DP-14	1120374.991	907529.601	Good condition, visible, moderate vegetation surrounding drainage pipe, water flowing out from pipe
DP-15	1120466.426	907499.452	Good condition, slightly visible, covered with water
DP-16	1120534.579	907482.788	Good condition, slightly visible, thick vegetation surrounding drainage pipe
DP-17	1120665.489	907442.420	Under drainage downchute riprap, not visible

NOTE: All drainage pipes inspected did not have any obstruction and were functioning as intended.

LMS INSPECTION FORMS

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: January 2020	WEATHER: 3.41˚ F avg. .09" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: February 2020	WEATHER: 29.07˚ F avg. .08" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: March 2020	WEATHER: 40.25˚F avg. .11" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

January 2020	WEATHER: 31.41°F avg. .09" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West basin discharged on 1/02, 1/03, 1/08, 1/27, 1/29 and 1/31. East basin discharged 1/02-1/08, 1/15-1/16 and 1/27-1/31.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" Godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

February 2020	WEATHER: 29.07˚ F avg. .08" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West basin discharged on 2/13, 2/14, and the 2/26. East basin discharged 2/13, 2/14, 2/18-2/20 and 2/26-2/28.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll).
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" Godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

March 2020	WEATHER: 40.25° F avg. .11" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West basin discharged on 3/10 and the 3/30. East basin discharged 3/4-3/6, 3/11, 3/12, 3/30, 3/31.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" Godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

PHOTO LOG

2020 Q1 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 1 to 6 monitored on 3/2/20. All vents were in good condition with tall grasses surrounding them. Additional details found on quarterly forms.



GV-1



GV-2



GV-3



GV-4



GV-5



GV-6

2020 Q1 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 7 to 12 monitored on 3/2/20. All vents were in good condition with tall grasses surrounding them. Additional details found on quarterly forms.



GV-7



GV-8



GV-9



GV-10



GV-11



GV-12

2020 Q1 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 13 to 17 monitored on 3/2/20. All vents were in good condition with tall grasses surrounding them. GV-13 continues to demonstrate a slight lean, and GV-16 has a very slight lean. Additional details found on quarterly forms.



GV-13



GV-14



GV-15



GV-16



GV-17

2020 Q1 INSPECTION PHOTOGRAPH LOG

Observations:
Small animal burrows were noted at GV-2, GV-3, GV-4, GV-6, GV-10, GV-14, GV-15, and GV-16. Additional small animal burrows were noted. Ground cover was good site-wide despite seasonal senescence, with few areas of patchy vegetation on berms. Additional details found on quarterly forms.



Typical condition of vegetation



Minor erosion rills forming at northern end of site



Sparse vegetation and small patch of daylighted geotextile on western berm



Example of typical animal burrow (near GV-6)



Additional small animal burrows near GV-6



Vegetation surrounding DP-13

2020 Q2 SCA Quarterly Inspection Package
Inspection, Operation, and Maintenance Forms

The 2020 Quarter 2 SCA inspection was completed on May 18, 2020. During the inspection the following items were evaluated:

- evidence of trespassing or unauthorized use of the final cover area
- evidence of subsidence or settling that results in low spots, or presence of erosion rills
- evidence of burrowing animals
- condition of vegetation
- observable irregularities such as bulges, bumps, slumps, or cracks
- evidence of ponded water
- condition of gas vents and drainage pipe outlets
- condition of access roads (i.e, erosion, aggregate washout, exposed geotextile, and debris on the road)
- condition of SCA perimeter berm
- condition of areas near anchor trenches, storm water control berms, and drainage channels

Overall, the site was found in good condition and there were no major irregularities to note. Ground cover and tall grasses are beginning to emerge from seasonal senescence, and dried cover from 2019 remains present around the vents. Minor signs of superficial erosion were noted near the toe of slope and on the eastern edge of the RECP installed in 2019 and will continue to be monitored throughout 2020. Only a few small isolated locations along berms remain with sparse vegetation. Small woody plants were identified in the NW downchute and W downchute in previous quarters and were removed. Few small woody plants have grown in the NW downchute and W downchute and their removal is planned in 2020.

The gas vents and drainage pipes were in good condition, as were the berms and drainage channels around the perimeter of the landfill. Evidence of small animal burrows were noted near gas vents GV-2, GV-3, GV-4, GV-6, GV-7, GV-8, GV-10, GV-14, GV-15, and GV-16. Additional small animal burrows were noted near GV-6 and between GV-3 and GV-4. Wildlife management will be performed prior to the repair of these small burrows (to be completed in 2020). No cap irregularities were observed. A small area of daylighting was noted to the North of the W downchute. A small pool, likely created from snowmelt, was noted on the southern side of the E downchute and will be monitored in future site visits. There were also several small pools also likely created from snowmelt found on the eastern edge of the RECP area.

Attachments to this package include completed field forms associated with this quarterly inspection, a photo log documenting the general condition of the gas vents cover, and monthly LMS inspection forms completed by Jacobs during this quarter. A figure with site condition observations and field notes has been included and will be used as reference for potential future enhancement seeding and RECP recommendations.

QUARTERLY FORMS & SITE RECON FIGURE

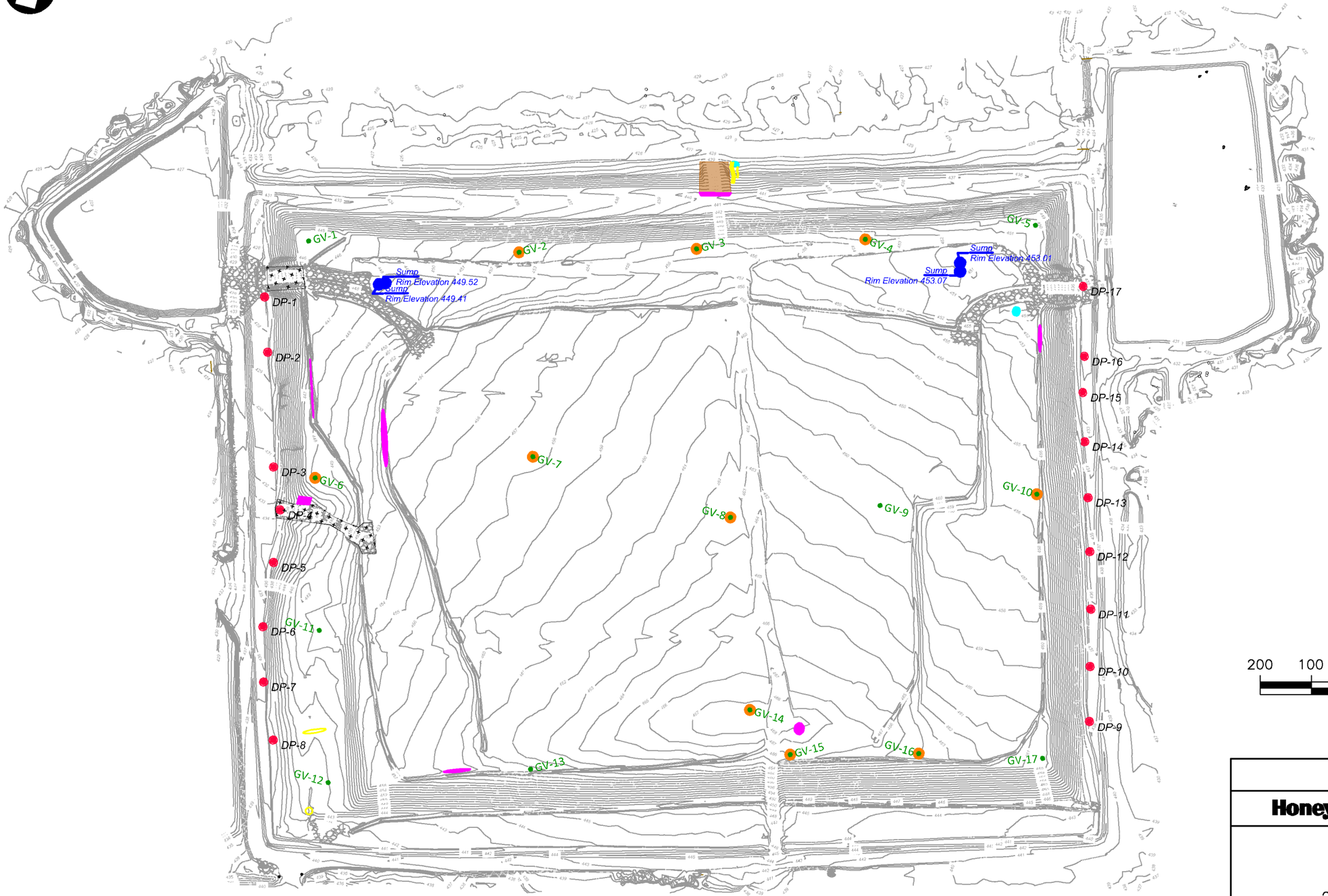
5-18-2020 GENERAL RECON		
ITEM	Y/N	COMMENT
Evidence of Tresspassing/ Unauthorized use of final cover area	N	n/a
Evidence of subsidence or settling/ low points/ depressions	N	n/a
Evidence of Burrowing animals	Y	Small animal burrows noted at the bases of GV-2, GV-3, GV-4, GV-6, GV-7, GV-8, GV-10, GV-14, GV-15 and GV-16. Wildlife management planned prior to repairs.
Presence of Erosion Rills	Y	Very minor signs of superficial erosion were noted near RECP placed in 2019.
Vegetation performing as intended	Y	Seasonal senescence of plants. Some tall grasses noted around gas vents.
Irregularities such as bulges, bumps, slumps or cracks observed	N	n/a
Evidence of ponded water	Y	Minor pooling noted on southern side of East swale and also in bare area adjacent to RECP placed in 2019.
Condition of access roads good (no aggregate washout, exposed geotextile, etc)	Y	Good condition
Perimeter berm in good condition	Y	Some areas of sparse vegetation were noted on berms. Area will continue to be monitored.
Proper function and integrity of diversion berms	Y	
Proper function and integrity of interception berms	Y	
Proper function and integrity of drainage channels	Y	Good condition. A few small woody plants were present in NW downchute, and in West downchute near GV-6.
Proper function and integrity of East & West Basin	Y	n/a

5-18-2020 GAS VENT LOCATIONS	
#	CONDITION (Gas vent structural integrity, plantings, cap irregularities)
GV-1	Vent straight and in good condition. Cap intact. Medium height grasses present.
GV-2	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-3	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-4	Vent straight and in good condition. Cap intact. Tall height grasses present. Small animal burrows present.
GV-5	Vent straight and in good condition. Cap intact. Medium height grasses present.
GV-6	Vent in good condition with a slight lean (consistent with previous recon)*. Cap intact. Medium height grass. Small animal burrows present.
GV-7	Vent straight and in good condition. Cap intact. Tall grasses present. Larger animal burrows present.
GV-8	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-9	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-10	Vent straight and in good condition. Cap intact. Medium height grasses present. One small animal burrow present.
GV-11	Vent straight and in good condition. Cap intact. Medium height grasses present.
GV-12	Vent in good condition with a slight lean (consistent with previous recon)* Cap intact. Tall grasses present.
GV-13	Vent in good condition although tilted (consistent with previous recon)*. Cap intact. Medium height grasses present.
GV-14	Vent straight and in good condition. Cap intact. Tall grasses present. Animal burrows present.
GV-15	Vent in good condition with a very slight lean (consistent with previous recon)*. Cap intact. Tall grasses present. Small animal burrows present.
GV-16	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-17	Vent in good condition with a very slight lean (consistent with previous recon)*. Cap intact. Medium height grasses present.

* Vents noted with a tilt/lean are consistent with previous monitoring observations and do not require any improvements or changes. All vents are functioning as intended.

5-18-20 Drainage Pipe Daylight Locations			
#	COORDINATES		COMMENTS
DP-1	1120202.677	905912.700	Under chute riprap, not visible
DP-2	1120100.239	905948.459	Good condition, slightly visible, covered with water, moderate vegetation surrounding drainage pipe
DP-3	1119888.374	906021.590	Not visible, covered with water
DP-4	1119811.170	906056.949	Under drainage downchute riprap, not visible
DP-5	1119709.306	906072.849	GPS coordinates ~10 ft. upslope of toe, could not find
DP-6	1119583.469	906088.100	Good condition, slightly visible, covered with water, thick vegetation surrounding drainage pipe
DP-7	1119479.886	906118.916	Good condition, visible, small vegetation surrounding drainage pipe
DP-8	1119376.185	906168.548	GPS coordinates ~10 ft. upslope of toe, could not find
DP-9	1119852.555	907690.460	3 ft. off from GPS coordinates; Good condition, visible, moderate vegetation surrounding drainage pipe
DP-10	1119956.045	907661.695	Good condition, slightly visible, covered with moss
DP-11	1120063.765	907631.793	Good condition, visible, moderate vegetation surrounding drainage pipe
DP-12	1120171.762	907598.511	Good condition, slightly visible, moderate vegetation surrounding drainage pipe, covered with moss, water flowing out from pipe
DP-13	1120271.798	907566.212	Good condition, slightly visible, thick vegetation surrounding drainage pipe, water flowing out from pipe
DP-14	1120374.991	907529.601	Good condition, visible, moderate vegetation surrounding drainage pipe, water flowing out from pipe
DP-15	1120466.426	907499.452	Good condition, slightly visible, covered with water
DP-16	1120534.579	907482.788	Good condition, slightly visible, thick vegetation surrounding drainage pipe, covered with water
DP-17	1120665.489	907442.420	Under drainage downchute riprap, not visible

NOTE: All drainage pipes inspected did not have any obstruction and were functioning as intended



LEGEND

- DRAIN PIPE
- GAS VENT
- SUMP/RISERS
- SMALL EROSION RILLS
- WOODY PLANTS PLANNED REMOVAL
- SPARSE VEGETATION
- SMALL ANIMAL BURROWS
- MINOR POOLING
- PREVIOUSLY INSTALLED RECP

200 100 0 200 400

SCALE: 1"=200'

FIGURE 1

Honeywell

SCA
SYRACUSE, NEW YORK

SCA
QUARTERLY REPORT
2ND QUARTER – 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450600 SCA OM&M\10.0 TECHNICAL CATAGORIES\10.3-QUARTERLY INSPECTIONS\2020\SCA-Q2-2020.DWG
PLOT DATE: 9/17/2021 8:36 AM PLOTTED BY: MORANZ, KAITLYN

LMS INSPECTION FORMS

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: April 2020	WEATHER: 43.98˚ F avg. .08" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: May 2020	WEATHER: 67.19˚ F avg. .13" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: June 2020	WEATHER: 69.69˚ F avg. .04" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

April 2020	WEATHER: 43.98° F avg. .08" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West basin discharged on 4/09 and the 4/27. East basin discharged 4/8-/15 and 4/27-4/29.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

May 2020	WEATHER: 67.19° F avg. .13" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West basin discharged on 5/05 and the 5/18. East basin discharged 5/4-5/8 and 5/18.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

June 2020	WEATHER: 69.69° F avg. .04" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: No discharge from the basins this month.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

PHOTO LOG

2020 Q2 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 1 to 6 monitored on 5/18/20. All vents were in good condition with tall grasses surrounding them. Additional details found on quarterly forms.



GV-1



GV-2



GV-3



GV-4



GV-5



GV-6

2020 Q2 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 7 to 12 monitored on 5/18/20. All vents were in good condition with tall grasses surrounding them. Additional details found on quarterly forms.



GV-7



GV-8



GV-9



GV-10



GV-11



GV-12

2020 Q2 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 13 to 17 monitored on 5/18/20. All vents were in good condition with tall grasses surrounding them. GV-13 continues to demonstrate a slight lean, and GV-16 has a very slight lean. Additional details found on quarterly forms.



GV-13



GV-14



GV-15



GV-16



GV-17

2020 Q2 INSPECTION PHOTOGRAPH LOG

Observations:
Small animal burrows were noted at GV-2, GV-3, GV-4, GV-6, GV-7, GV-8, GV-10, GV-14, GV-15, and GV-16. Ground cover was good site-wide, with few areas of patchy vegetation on berms. Additional details found on quarterly forms.



Typical condition of vegetation



Minor erosion rills forming at northern end of site



Sparse vegetation near northern RECP



Example of typical animal burrow (near GV-7)



Woody plants in western downchute



Vegetation surrounding DP-11

2020 Q3 SCA Quarterly Inspection Package
Inspection, Operation, and Maintenance Forms

The 2020 Quarter 3 SCA inspection was completed on July 31, 2020. During the inspection the following items were evaluated:

- evidence of trespassing or unauthorized use of the final cover area
- evidence of subsidence or settling that results in low spots, or presence of erosion rills
- evidence of burrowing animals
- condition of vegetation
- observable irregularities such as bulges, bumps, slumps, or cracks
- evidence of ponded water
- condition of gas vents and drainage pipe outlets
- condition of access roads (i.e, erosion, aggregate washout, exposed geotextile, and debris on the road)
- condition of SCA perimeter berm
- condition of areas near anchor trenches, storm water control berms, and drainage channels

Overall, the site was found in good condition and there were no major irregularities to note. Ground cover is high and tall grasses are present throughout the site. Minor signs of superficial erosion were noted near the end and on the eastern edge of the RECP installed in 2019 and will continue to be monitored throughout 2020. Only a few small isolated locations along berms and very small patches along the southern edge of the site remain with sparse vegetation. Small woody plants were identified in the NW downchute and W downchute in previous quarters and were removed. Few small woody plants have grown in the NW downchute and W downchute and their removal is planned in 2020.

The gas vents and drainage pipes were in good condition, as were the berms and drainage channels around the perimeter of the landfill. Evidence of small animal burrows were noted near gas vents GV-2, GV-3, GV-4, GV-6, GV-7, GV-8, GV-10, GV-12, GV-14, GV-15, and GV-16. Wildlife management was performed, and the remaining burrows were filled with soil and seeded with a cover crop of oats on August 5, 2020. No cap irregularities were observed. A small area of daylighting was noted to the North of the W downchute.

Attachments to this package include completed field forms associated with this quarterly inspection, a photo log documenting the general condition of the gas vents cover, and monthly LMS inspection forms completed by Jacobs during this quarter. A figure with site condition observations and field notes has been included and will be used as reference for potential future enhancement seeding and RECP recommendations.

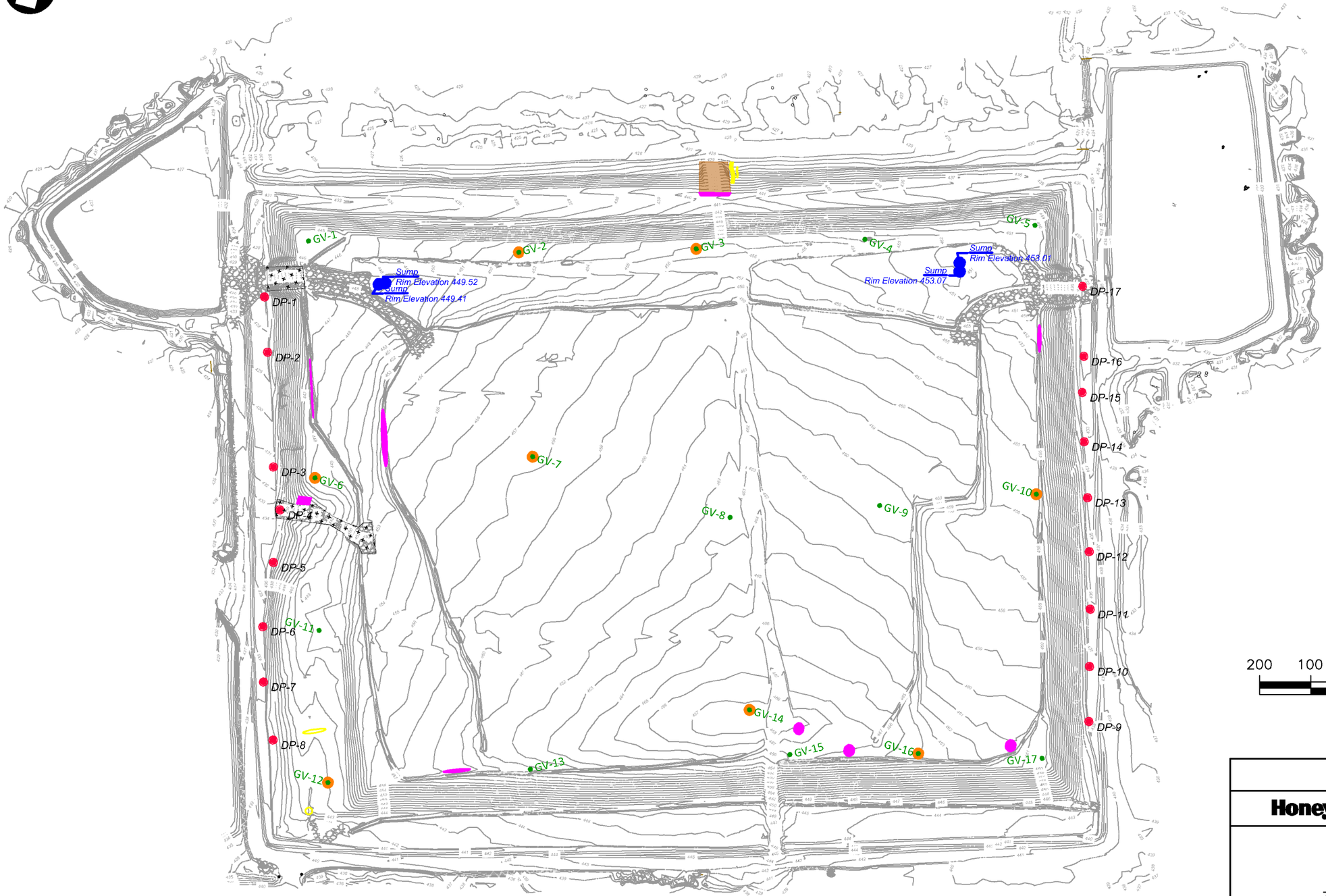
QUARTERLY FORMS & SITE RECON FIGURE

7-31-2020 GENERAL RECON		
ITEM	Y/N	COMMENT
Evidence of Tresspassing/ Unauthorized use of final cover area	N	n/a
Evidence of subsidence or settling/ low points/ depressions	N	n/a
Evidence of Burrowing animals	Y	Small animal burrows noted at the bases of GV-2, GV-3, GV-4, GV-6, GV-7, GV-8, GV-10, GV-14, GV-15 and GV-16. Wildlife management and repairs conducted.
Presence of Erosion Rills	Y	Small rills have started to form near RECP placed in 2019.
Vegetation performing as intended	Y	Grasses noted throughout site. Tall grasses noted around most gas vents.
Irregularities such as bulges, bumps, slumps or cracks observed	N	n/a
Evidence of ponded water	N	n/a
Condition of access roads good (no aggregate washout, exposed geotextile, etc)	Y	Good condition
Perimeter berm in good condition	Y	Some areas of sparse vegetation were noted on berms and along the southern edge of the site. Area will continue to be monitored.
Proper function and integrity of diversion berms	Y	
Proper function and integrity of interception berms	Y	
Proper function and integrity of drainage channels	Y	Good condition. A few small woody plants were present in NW downchute, and in West downchute.
Proper function and integrity of East & West Basin	Y	n/a

7-31-2020 GAS VENT LOCATIONS	
#	CONDITION (Gas vent structural integrity, plantings, cap irregularities)
GV-1	Vent straight and in good condition. Cap intact. Medium height grasses present.
GV-2	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-3	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-4	Vent straight and in good condition. Cap intact. Tall height grasses present. Small animal burrows present.
GV-5	Vent straight and in good condition. Cap intact. Medium height grasses present.
GV-6	Vent in good condition with a slight lean (consistent with previous recon)*. Cap intact. Medium height grass. Small animal burrows present.
GV-7	Vent straight and in good condition. Cap intact. Tall grasses present. Very small animal burrows present.
GV-8	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-9	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-10	Vent straight and in good condition. Cap intact. Tall grasses present. Base dug out by animals.
GV-11	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-12	Vent in good condition with a slight lean (consistent with previous recon)* Cap intact. Tall grasses present. Small animal burrows present.
GV-13	Vent in good condition although tilted (consistent with previous recon)*. Cap intact. Tall grasses present.
GV-14	Vent straight and in good condition. Cap intact. Tall grasses present. Large animal burrows present.
GV-15	Vent in good condition with a very slight lean (consistent with previous recon)*. Cap intact. Tall grasses present. Small animal burrows present.
GV-16	Vent straight and in good condition. Cap intact. Tall grasses present. Small animal burrows present.
GV-17	Vent in good condition with a very slight lean (consistent with previous recon)*. Gas vent cap loose but repaired during inspection. Tall grasses present.

* Vents noted with a tilt/lean are consistent with previous monitoring observations and do not require any improvements or changes. All vents are functioning as intended.

7-31-20 Drainage Pipe Daylight Locations			
#	COORDINATES		COMMENTS
DP-1	1120202.677	905912.700	Under chute riprap, not visible
DP-2	1120100.239	905948.459	Good condition, slightly visible, thick vegetation surrounding drainage pipe
DP-3	1119888.374	906021.590	Not visible
DP-4	1119811.170	906056.949	Under drainage downchute riprap, not visible
DP-5	1119709.306	906072.849	GPS coordinates ~10 ft. upslope of toe, could not find
DP-6	1119583.469	906088.100	Good condition, slightly visible, thick vegetation surrounding drainage pipe
DP-7	1119479.886	906118.916	Good condition, visible, thick vegetation surrounding drainage pipe
DP-8	1119376.185	906168.548	GPS coordinates ~10 ft. upslope of toe, could not find
DP-9	1119852.555	907690.460	3 ft. off from GPS coordinates; Good condition, slightly visible, vegetation surrounding drainage pipe
DP-10	1119956.045	907661.695	Good condition, slightly visible, covered with moss, thick
DP-11	1120063.765	907631.793	Good condition, visible, moderate vegetation surrounding drainage pipe
DP-12	1120171.762	907598.511	Good condition, visible, moderate vegetation in front of drainage pipe
DP-13	1120271.798	907566.212	Good condition, mostly visible, sparse vegetation surrounding drainage pipe
DP-14	1120374.991	907529.601	Good condition, visible, moderate vegetation surrounding drainage pipe
DP-15	1120466.426	907499.452	Good condition, visible, sparse vegetation near drainage pipe
DP-16	1120534.579	907482.788	Good condition, slightly visible, moderate vegetation surrounding drainage pipe
DP-17	1120665.489	907442.420	Under drainage downchute riprap, not visible



LEGEND

- DRAIN PIPE
- GAS VENT
- SUMP/RISERS
- SMALL EROSION RILLS
- WOODY PLANTS PLANNED REMOVAL
- SPARSE VEGETATION
- SMALL ANIMAL BURROWS
- PREVIOUSLY INSTALLED RECP

200 100 0 200 400

SCALE: 1"=200'

FIGURE 1

Honeywell

SCA
SYRACUSE, NEW YORK

SCA
QUARTERLY REPORT
3RD QUARTER – 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450600 SCA OM&M\10.0 TECHNICAL CATAGORIES\10.3-QUARTERLY INSPECTIONS\2020\SCA-Q3-2020.DWG
PLOT DATE: 9/17/2021 8:19 AM PLOTTED BY: MORANZ, KAITLYN

LMS INSPECTION FORMS

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: July 2020	WEATHER: 76.77° F avg. .18" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: August 2020	WEATHER: 72.63˚ F avg. .15" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: September 2020	WEATHER: 63.6˚ F avg. .05" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

July 2020	WEATHER: 76.22° F avg. .18" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West Basin Discharge: 7/23. East Basin Discharge: 7/21-7/24.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

August 2020	WEATHER: 72.63° F avg. .15" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: No discharge
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

September 2020	WEATHER: 63.6° F avg. .05" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: No discharge
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

PHOTO LOG

2020 Q3 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 1 to 6 monitored on 7/31/20. All vents were in good condition with tall grasses surrounding them. Additional details found on quarterly forms.



GV-1



GV-2



GV-3



GV-4



GV-5



GV-6

2020 Q3 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 7 to 12 monitored on 7/31/20. All vents were in good condition with tall grasses surrounding them. Additional details found on quarterly forms.



GV-7



GV-8



GV-9



GV-10



GV-11



GV-12

2020 Q3 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 13 to 17 monitored on 7/31/20. All vents were in good condition with tall grasses surrounding them. GV-13 continues to demonstrate a slight lean, and GV-16 has a very slight lean. Additional details found on quarterly forms.



GV-13



GV-14



GV-15



GV-16



GV-17

2020 Q3 INSPECTION PHOTOGRAPH LOG

Observations:
Small animal burrows were noted at GV-2, GV-3, GV-4, GV-6, GV-10, GV-14, GV-15, and GV-16. Ground cover was good site-wide, with few areas of patchy vegetation on berms. Additional details found on quarterly forms.



Typical condition of vegetation



Stabilization noted at previously repaired erosion rill



Sparse vegetation and minor erosion rills near previously installed RECP



Example of typical animal burrow (near GV-6)



Woody plants in western downchute



Vegetation surrounding DP-2 (not blocking drainage)

2020 Q4 SCA Quarterly Inspection Package
Inspection, Operation, and Maintenance Forms

The 2020 Quarter 4 SCA inspection was completed on October 30, 2020. During the inspection the following items were evaluated:

- evidence of trespassing or unauthorized use of the final cover area
- evidence of subsidence or settling that results in low spots, or presence of erosion rills
- evidence of burrowing animals
- condition of vegetation
- observable irregularities such as bulges, bumps, slumps, or cracks
- evidence of ponded water
- condition of gas vents and drainage pipe outlets
- condition of access roads (i.e, erosion, aggregate washout, exposed geotextile, and debris on the road)
- condition of SCA perimeter berm
- condition of areas near anchor trenches, storm water control berms, and drainage channels

Overall, the site was found in good condition and there were no major irregularities to note. Ground cover is high and tall grasses are present throughout the site. Minor signs of superficial erosion were noted near the end and on the eastern edge of the RECP installed in 2019 and will continue to be monitored throughout 2021. Only a few small isolated locations along berms and very small patches along the southern and eastern edges of the site remain with sparse vegetation. Few small woody plants have grown in the NW downchute and W downchute and their removal is planned in 2021.

The gas vents and drainage pipes were in good condition, as were the berms and drainage channels around the perimeter of the landfill. Evidence of new small animal burrows were noted near gas vents GV-4, GV-14, and GV-17. No cap irregularities were observed.

Attachments to this package include completed field forms associated with this quarterly inspection, a photo log documenting the general condition of the gas vents cover, and monthly LMS inspection forms completed by Jacobs during this quarter. A figure with site condition observations and field notes has been included and will be used as reference for potential future enhancement seeding and RECP recommendations.

QUARTERLY FORMS & SITE RECON FIGURE

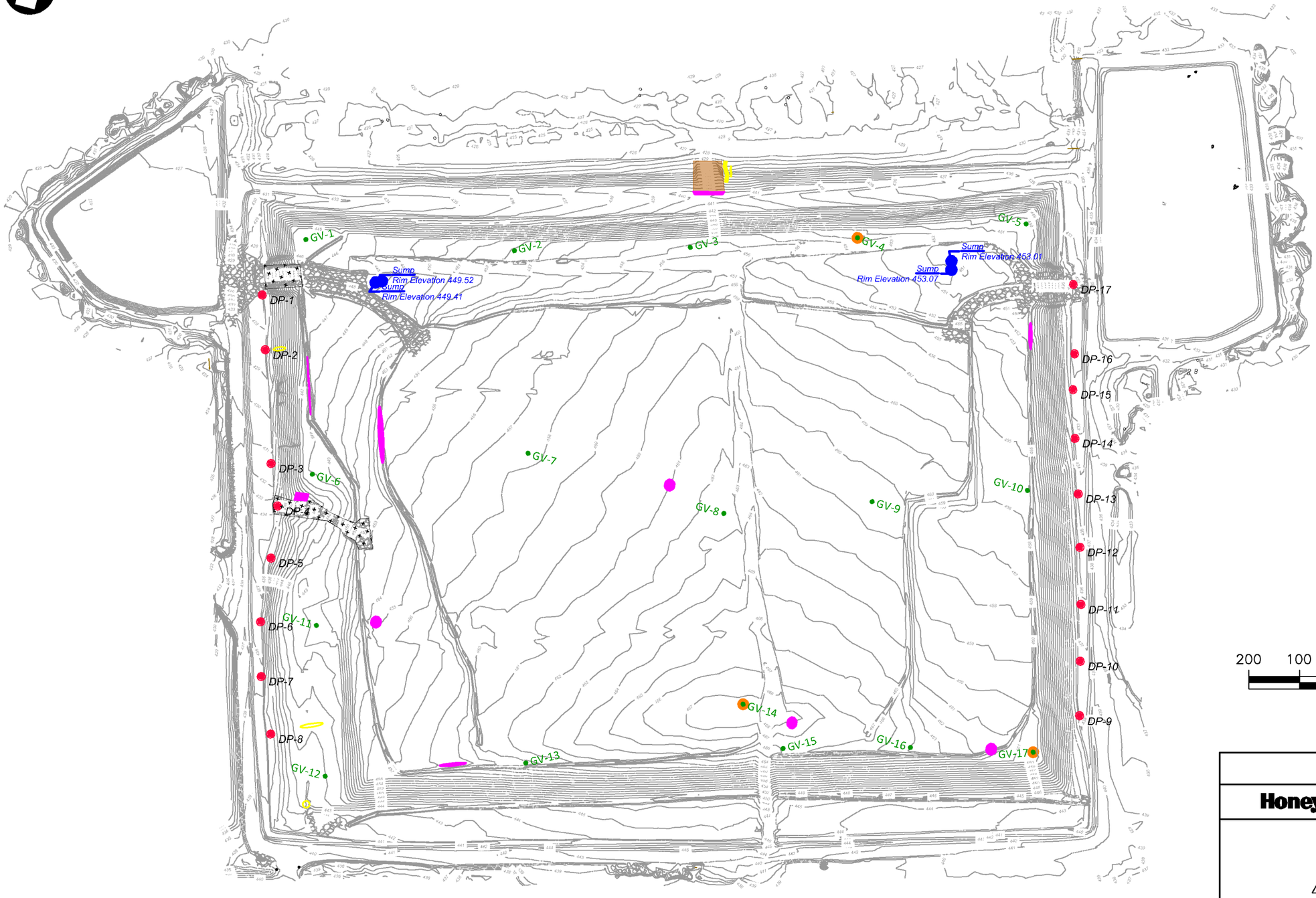
10-30-2020 GENERAL RECON		
ITEM	Y/N	COMMENT
Evidence of Tresspassing/ Unauthorized use of final cover area	N	n/a
Evidence of subsidence or settling/ low points/ depressions	N	n/a
Evidence of Burrowing animals	Y	Wildlife management and repairs conducted in previous quarter. New small animal burrows noted at the bases of GV-4, GV-14, and GV-17.
Presence of Erosion Rills	Y	Slight erosion noted on western edge of site.
Vegetation performing as intended	Y	Very short grasses throughout the site. Tall grasses noted around most gas vents.
Irregularities such as bulges, bumps, slumps or cracks observed	N	n/a
Evidence of ponded water	N	n/a
Condition of access roads good (no aggregate washout, exposed geotextile, etc)	Y	Good condition
Perimeter berm in good condition	Y	Some areas of sparse vegetation were noted on berms and along the southern edge of the site. Area will continue to be monitored.
Proper function and integrity of diversion berms	Y	
Proper function and integrity of interception berms	Y	
Proper function and integrity of drainage channels	Y	Good condition. A few small woody plants were present in NW downchute, and in West downchute.
Proper function and integrity of East & West Basin	Y	n/a

10-30-2020 GAS VENT LOCATIONS	
#	CONDITION (Gas vent structural integrity, plantings, cap irregularities)
GV-1	Vent straight and in good condition. Gas vent cap loose but repaired during inspection. Tall grasses present.
GV-2	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-3	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-4	Vent in good condition with a very slight lean. Cap intact. Tall height grasses present. Small animal burrows present.
GV-5	Vent straight and in good condition. Cap intact. Short grasses in immediate area, tall grasses surrounding.
GV-6	Vent in good condition with a slight lean (consistent with previous recon)*. Cap intact. Tall grasses present. Small patch of sparse vegetation nearby.
GV-7	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-8	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-9	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-10	Vent straight and in good condition. Cap intact. Short grasses in immediate area, tall grasses surrounding.
GV-11	Vent straight and in good condition. Cap intact. Tall grasses present.
GV-12	Vent in good condition with a slight lean (consistent with previous recon)* Cap intact. Tall grasses present.
GV-13	Vent in good condition although tilted (consistent with previous recon)*. Cap intact. Short grasses in immediate area, tall grasses surrounding.
GV-14	Vent straight and in good condition. Cap intact. Tall grasses present. Small patch of sparse vegetation nearby. Small animal burrow present.
GV-15	Vent in good condition with a very slight lean (consistent with previous recon)*. Cap intact. Short grasses in immediate area, tall grasses surrounding.
GV-16	Vent straight and in good condition. Cap intact. Short grasses in immediate area, tall grasses surrounding.
GV-17	Vent in good condition with a very slight lean (consistent with previous recon)*. Cap intact. Tall grasses present. Very small animal burrow present.

* Vents noted with a tilt/lean are consistent with previous monitoring observations and do not require any improvements or changes. All vents are functioning as intended.

10-30-20 Drainage Pipe Daylight Locations			
#	COORDINATES		COMMENTS
DP-1	1120202.677	905912.700	Under chute riprap, not visible
DP-2	1120100.239	905948.459	Not visible
DP-3	1119888.374	906021.590	Good condition, slightly visible, inundated with water
DP-4	1119811.170	906056.949	Under drainage downchute riprap, not visible
DP-5	1119709.306	906072.849	GPS coordinates ~10 ft. upslope of toe, could not find
DP-6	1119583.469	906088.100	Good condition, slightly visible, vegetation surrounding drainage pipe, inundated with water
DP-7	1119479.886	906118.916	Good condition, visible, vegetation surrounding drainage pipe, covered with shallow layer of water
DP-8	1119376.185	906168.548	GPS coordinates ~10 ft. upslope of toe, could not find
DP-9	1119852.555	907690.460	3 ft. off from GPS coordinates; Good condition, slightly visible, vegetation surrounding drainage pipe, covered with shallow layer of water
DP-10	1119956.045	907661.695	Good condition, visible, vegetation in front of drainage pipe
DP-11	1120063.765	907631.793	Good condition, slightly visible, vegetation covering drainage pipe
DP-12	1120171.762	907598.511	Good condition, slightly visible, vegetation covering drainage pipe, water flowing from drainage pipe
DP-13	1120271.798	907566.212	Good condition, slightly visible, moderate vegetation surrounding drainage pipe
DP-14	1120374.991	907529.601	Good condition, visible, vegetation surrounding drainage pipe, water flowing from drainage pipe
DP-15	1120466.426	907499.452	Good condition, slightly visible, indundated with water
DP-16	1120534.579	907482.788	Good condition, slightly visible, indundated with water
DP-17	1120665.489	907442.420	Under drainage downchute riprap, not visible

NOTE: All drainage pipes inspected did not have any obstruction and were functioning as intended



LEGEND

- DRAIN PIPE
- GAS VENT
- SUMP/RISERS
- SMALL EROSION RILLS
- WOODY PLANTS PLANNED REMOVAL
- SPARSE VEGETATION
- SMALL ANIMAL BURROWS
- PREVIOUSLY INSTALLED RECP

200 100 0 200 400

SCALE: 1"=200'

FIGURE 1

Honeywell

SCA
SYRACUSE, NEW YORK

SCA
QUARTERLY REPORT
4TH QUARTER – 2020

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450600 SCA OM&M\10.0 TECHNICAL CATAGORIES\10.3-QUARTERLY INSPECTIONS\2020\SCA-Q4-2020.DWG
PLOT DATE: 9/17/2021 8:17 AM PLOTTED BY: MORANZ, KAITLYN

LMS INSPECTION FORMS

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: October 2020	WEATHER: 51.74˚ F avg. .11" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: November 2020	WEATHER: 45.95˚ F avg. .07" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
LIQUID MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

DATE/TIME: December 2020	WEATHER: 33.77° F avg. .1" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS:
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed monthly the first year. Form to be completed as appropriate for inspections done during active pumping (first item is mandatory) and if repairs or maintenance are conducted.
2. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Sump high level alarms and flow gauges are operational (and flow data is being recorded)	
		X	System automatic controls are operational.	Automated system is operational, but not used due to low volumes and systems run in batch mode. The system is run manually, and the operator remains on site while pumping to monitor the system.
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	Sumps are ran together to prevent backflow.
		X	Sump operational controls are set to prevent sump liquid depth from exceeding 6 feet. Confirm pumps and flow gauges are operational.	Sump levels are checked daily and are pumped to bottom when WTP discharge is permitted. Automated system is operational, but not used due to low levels and systems run in batch mode. Alarm system is active to alert for high levels.
X			Aboveground piping and insulation are in good condition. Inspect during active pumping.	
X			Underground utility markings/signs are in good condition.	
X			Riser covers are intact and secured.	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Repair of signage or markers	
Cleaning of/maintenance on system piping	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

October 2020	WEATHER: 51.74° F avg. .11" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West Basin: 10/6, 10/21 and 10/27. East Basin: 10/6-10/7 and 10/27-10/30.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

November 2020	WEATHER: 45.95° F avg. .07" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West Basin: 11/12. East Basin: 11/12-11/13.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

INSPECTION FORM
HONEYWELL – SCA POST CLOSURE CARE PLAN
STORM WATER MANAGEMENT SYSTEM
SYRACUSE, NEW YORK

GENERAL SITE INFORMATION

December 2020	WEATHER: 33.77° F avg. .1" precipitation
INSPECTOR/OPERATOR NAME: Robert Davies	COMMENTS: West Basin: 12/16, 12/28. East Basin: 12/2-12/4, 12/21-12/22, 12/28-12/31.
OM&M CONTRACTOR: Jacobs	

Notes:

1. Inspection form to be fully completed quarterly. Form to be completed as appropriate for inspections done during active pumping and if repairs or maintenance are conducted.
2. Pumping from east basin to outfall 18 only occurs when TSS < 50 mg/l and with notification/approval from OBG (now Ramboll)
3. Attach additional documentation and photographs as appropriate. Note locations for issues identified below.

Inspection

Yes	No	N/A	Item	Notes
X			Are the East and West basin pumps operating properly	East basin pumped to outfall using 3" godwin diesel pump.
X			Aboveground piping is in good condition. Inspect during active pumping	
X			Instrumentation and valves are in good condition. Note sticking or jammed devices, corrosion, leaks, and misalignments.	
X			Are the level indicators in the East and West basin operational	
X			Diversion berms, interception berms and drainage channels functioning properly	

Repair/Maintenance Activities

Item	Notes
Calibration, operations, maintenance of mechanical and electrical equipment including pumps and flow meters	
Cleaning of/maintenance on system piping	
Removal of debris or any other objects obstructing flow in drainage channels	No issues with drainage channels observed.
Cleaning of clogged riprap and East and West basins	
Repair of damaged storm water, erosion, and sediment control structures	
Other repairs	

PHOTO LOG

2020 Q4 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 1 to 6 monitored on 10/30/20. All vents were in good condition with tall grasses surrounding them. Additional details found on quarterly forms.



GV-1



GV-2



GV-3



GV-4



GV-5



GV-6

2020 Q4 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 7 to 12 monitored on 10/30/20. All vents were in good condition with tall grasses surrounding them. Additional details found on quarterly forms.



GV-7



GV-8



GV-9



GV-10



GV-11



GV-12

2020 Q4 INSPECTION PHOTOGRAPH LOG

Observations:
Photos below include gas vents 13 to 17 monitored on 10/30/20. All vents were in good condition with tall grasses surrounding them. GV-13 continues to demonstrate a slight lean, and GV-16 has a very slight lean. Additional details found on quarterly forms.



GV-13



GV-14



GV-15



GV-16



GV-17

2020 Q4 INSPECTION PHOTOGRAPH LOG

Observations:
Small animal burrows were noted at GV-4, GV-14, and GV-17. Ground cover was good site-wide despite seasonal senescence, with small areas of patchy vegetation noted. Additional details found on quarterly forms.



Typical condition of vegetation



Vegetation growth in previously noted erosion rill (Southeast corner)



Sparse vegetation near GV-11



Example of small animal burrow (near GV-4)



Example of mowing buffer around gas vent



Vegetation surrounding and water covering DP-13